THE

VETERINARY JOURNAL

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Editorials.

1903.

IN commencing the new year, the ninth under our editorship, we have to thank our readers for their support during the past, and to remind them of what we said last month regarding the valuable accession to the editorial staff and the modification of price of our JOURNAL, which is to be combined with greater practical efficiency. Among our special features will be full information regarding Army Veterinary Department matters, such as promotions, retirements, changes of station, and the war and other services of members of the A.V.D. We propose also to give more space in future to the consideration of legal cases and decisions which affect the profession, as also of questions of professional ethics and etiquette.

We have in the past devoted much space to translations from foreign journals, knowing as we do that many diseases prevail on the Continent of Europe, in America, and elsewhere which are unknown or but little known to us, and yet which threaten to invade our shores and diminish our wealth. We hope, with the valuable assistance of Colonel Nunn and other accomplished contributors, to extend these translations and to put the latest information from France, Germany, Belgium, Italy, Russia, and South America at the disposal of our readers.

ROCKS AHEAD!

A NIGGER pilot was at the helm of a steamer as she passed through a narrow channel. "I suppose you have a very minute knowledge of this part of the world?" said a passenger. "Yessah," replied the pilot. "And you know every rock, big and little?" "Yessah, de whole ob dem—de big ones and de little ones." At that moment the steamer struck upon a hidden reef and heeled over on her side, "And dat's one ob dem!" said the nigger with a grin as the vessel sank. This story may be taken as an illustration of the present position of Great Britain. We are passing through a narrow and

difficult channel, beset by rocks and shoals on every side, and we have no competent pilot. Our first intimation of a disaster will be actual contact with it, when perhaps irreparable damage will have already been done, and our progress will have been arrested, if indeed total wreckage has not taken place. Naturally our readers are alarmed at our vaticinations, and ask for something more precise and less mystical. In plain language, then, we must warn them, and through them the country at large, of the imminent danger of a foreign invasion. We are not mad, our heads have not been inflamed by war panic, nor on the other hand are we in Mr. Brodrick's confidence. We have not heard that the Chinese are preparing a vast army wherewith to overwhelm our little island; nor has the German Emperor or the Czar intimated privately to us that he intends shortly to bombard our sea-ports and—try to—land an armed force in Kent or Sussex. The invasion which in our opinion threatens our safety, almost our existence, is of a more subtle nature, and is therefore more formidable and alarming. What we dread is an invasion of disease. We have long enjoyed immunity from serious disease in this country. We have established checks at our ports and formulated regulations which have apparently worked well and quite smoothly, and we have allowed ourselves to be lulled into a sense of security which may one day prove deceptive and perhaps fatal. Our guardians are honest, zealous, and vigilant men, but they labour under the serious disadvantage of being almost entirely insular. They have gone through a long course of study and become acquainted with the diseases which prevail in *this* country, but of such diseases as rinderpest, red-water disease, entique, &c. &c., which desolate foreign countries, they have no knowledge. Foot-and-mouth disease has been stamped out of our herds and flocks, but it causes fearful ravages in America; red-water, rabies, rinderpest, are terrors to our Continental neighbours, as any one may learn from a perusal of foreign veterinary journals, but opportunities of studying these diseases in our country are very rare. Of course this is matter for congratulation, but certainly not for sleepy indifference. How are our guardians to detect maladies which they have never seen, much less studied? The long immunity from such scourges in Great Britain brings with itself its own danger; from a state of profound peace we may suddenly be roused to face a terrible war. For it must be remembered that the men who faced these formidable enemies for us in the sixties and seventies, and enabled us to vanquish them, are nearly all dead, and those who are still mercifully spared to us are either retired men or too old to undertake heavy work. It is interesting to recall some of these heroic souls who have passed from us. Let us remember with gratitude Gamgee, Brown, Simonds, Cope, M'Call, Duguid, Fleming, and among scores of others the late Principal of this College, and of all these the only active ones left are Cope and M'Call, Senior.

A plausible reply to our gloomy prophecy would be that the mere appearance—the very suspicion—of sickness in animals coming from abroad would cause their detention and immediate slaughter, but this does not remove the difficulty. The symptoms of deadly disease are not always alarming, but the danger of the disease is all the more subtle on that account. An animal may be passed as healthy, or as suffering from a simple disease, when it is really suffering from some horrible malady in its initial stages, and then, before we know where we are, the contagion has spread over a whole county. Further, it is conceivable that contagion is spread by the imperfectly cured skin of an animal used as a hearth-rug, or by the clothing of a farmer or soldier who has been, say, in South Africa. A farmer's son, let us suppose, has been doing military duty for his country in Africa. He has heard of that deadly scourge rinderpest and wishes to see a case. This is easily accomplished, and the young man, intensely interested, approaches the suffering animal and even handles it. Who can tell whether germs lodge themselves in his clothing or not, and whether these germs survive their transport to England or not? They may, they probably do, and so when the youth returns to his home and parades for the gratification of paternal pride in full regimentals, he distributes the death-dealing microbes amongst his father's stock with perfect unconsciousness. Next week a cow or bullock is dull and heavy and refuses its food; the veterinary surgeon—let us suppose him to be the most skilful man in the county or the whole country—is called in to prescribe, but he cannot diagnose a disease which he has never seen, still less can the farmer's son, who has had no scientific training, diagnose even a disease which he has seen. Medicine is prescribed and the sick animal is left in the cattle-shed amongst its neighbours for a day or two; but meantime market day has arrived, and the kindly farmer, who has been assiduous in his attendance on the sick animal, goes off to the nearest market town, where a sale of live stock is being held. He buys a number of bullocks and sends them to his farm—now a focus of infection—and in the meantime he conveys the disease to a number of healthy animals, which go off in their turn to spread the plague in more or less distant places. Only when it is too late to prevent a huge disaster is it learnt, by accident or intuition, that rinderpest has again made its appearance in Great Britain. Now let us remember what all this signifies. We have used the words "by accident or intuition" advisedly as being the only words possible, and they are words of terrible import. When the safety of our flocks and herds—that is, a great part of our national wealth—is at stake, nothing ought to be left to accident or intuition, most certainly not when precision and certainty are attainable. But the Board of Agriculture seems to care for none of these things. It seems to ignore the fact that almost all the veterans are dead or unavailable, and that the younger generation

of veterinarians are, from no fault of their own, ignorant of the modern conditions of disease,—so far, we mean, as Continental and Transatlantic maladies are concerned. It is idle, it is quite futile, it is almost criminal, to talk of increased severity. Severity when carried to excess in a blind way is as bad as laxity. The present writer remembers an outbreak of disease in Scotland which led to hopeless confusion and enormous loss. One Government veterinary inspector pronounced the disease to be so-and-so, and as a result of his pronouncement an embargo was laid on that county. No live stock could be transported from the farms to the towns. Markets were deserted, food supplies ran short, confusion reigned everywhere, farmers and butchers grumbled and swore, and all to no purpose and for no reason. An expert was called in, a man of vast experience and great courage. He examined a great number of the sick animals and boldly declared that the disease was not what it had been supposed to be, but some other malady resembling the dreaded one, yet quite innocuous. Of course the relief to all persons concerned was immediate and enormous, but the danger lay in the fact that the veterinary inspector had made a wrong diagnosis and thereby lost the confidence of the authorities and his neighbours, and the consequence of this loss of confidence meant that next time he diagnosed, correctly, the malignant disease he might not be believed and the disease would cause terrible havoc. In this case, of course, the veterinary surgeon was to blame; he ought to have known what he was doing, as the disease in question was no obscure or foreign plague. But what we wish to point out is that a veterinary surgeon *may* not be to blame; he may be asked to diagnose a disease which he has never seen and has had no opportunity of seeing, and then the blame will not attach to him but to the Board of Agriculture, and escape from this blame will not be possible through any increase of severity in administering existent regulations.

If we have proved our contention—and we think we have—and satisfied our readers that a serious danger threatens the country, we shall be asked how we propose to avert the danger. It is not for humble persons like ourselves to instruct the Government of this country, but we may venture on a few suggestions. We would propose that the Board of Agriculture send every year a number of young veterinary surgeons to South Africa and South America in order that they may there have an opportunity of studying rinderpest and other diseases which do not now occur in this country. These young men may be attached to the local staff, and ought to be sent in turn to all the infected parts of the colony, so as to have facilities for studying the conditions of health, the food supplies, and the habits and customs of the people, as well as the pathological conditions which prevail. It has been said that a veterinary surgeon ought to study his clients as carefully as he studies his patients, and this is no mere witticism or cynical advice, but

embodies much sound practical wisdom. Who amongst us has not found that disease in a horse was simply the result of bad ventilation in the stable, for which the dense ignorance or stupid obstinacy of the owner was responsible? In the same way a study of Boer farmer life or Kaffir customs might throw light on many an obscure problem. We should therefore suggest that the young veterinary surgeons should pass a time in the administrative department as well as in the scientific department and in the field.

After a time spent in Africa the young surgeons might return to England, or they might be sent on to India to extend their knowledge of disease and pathological conditions. Or a classification might be made: surgeons who have only studied in Africa might be restricted to appointments at sea-ports in this country where trade with Africa is carried on, whilst the more ambitious men who have gone further afield—as, for instance, to India and America—might obtain home appointments as general inspectors, ready to start at any moment when summoned to a difficult case, and paying periodical visits to the various sea-ports and market towns of the country. Of course it goes without saying that some carefully elaborated scheme of *permanent* service, of promotion, of satisfactory pay, and adequate pension must form part of any general plan for dealing with this difficult problem, but as this is matter of detail we leave it for the present.

A difficulty might be found in dealing with foreign countries like Argentina, where language, laws, and customs are different from our own, and where there yet is immense scope for study and investigation. We do not despair of a successful scheme even here. The Argentine Government might be glad to have the advice and co-operation of English surgeons, and might even be willing to pay them for their services, if by that means a better understanding could be brought about between the two countries. How much ignorance and prejudice does there not exist between Great Britain and foreign countries? We should like to know how many Englishmen are aware that Venezuela, for instance, about which there is so much talk at present, is more than twice the size of France. It is the same with Argentina. At the present moment we forbid the import of cattle from that country for fear of introducing diseases which prevail in some of its provinces. Perhaps it may be found that this unreasoning fear on our part is wholly unreasonable, and that important modifications might be made which, whilst permitting commercial intercourse on an immense scale, would yet be sufficient to protect us from infection. We throw out these general hints; we leave it for wiser heads than our own to formulate and codify them.

THE LATE "VETERINARIAN."

WE regret to record the cessation of our venerable contemporary, which took place last month. The event did not quite surprise us, but we were not aware that the vital current had quite so far ebbed, and we had hoped to break many a lance yet with our once doughty antagonist, but, as our old friend Virgil says, *Dis aliter visum*—it seemed otherwise to the gods. It had attained its 900th number and 75th volume.

The *Veterinarian* was founded in 1829, and had for its first editors two very distinguished men, Youatt and Percival, men whose names are household words throughout all veterinary and agricultural circles in Great Britain, America, and even the Continent of Europe. In 1833 they obtained the co-operation of the late Professor Dick, and later they were joined by Karkeek and Le Blanc. In 1856 Messrs. Morton and Simonds took up the reins of government, and ten years after obtained the assistance of Messrs. Varnell, Tuson, and Brown. The late Dr. George Fleming joined the staff in 1872 for a time, and Messrs. Spencer and Cobbold in 1875. In 1881 Mr. Simonds, who had been editor-in-chief since 1868, added Mr. Robertson to his staff, in 1886 Mr. Axe, and in 1891 Mr. M'Call. In 1894 Mr. M'Queen became editor, and was succeeded in 1895 by Messrs. Aitken, Dewar, and Mettam, but from 1896 to the demise of the Journal Mr. Mettam was sole editor.

There were giants in those days, and they acted valiantly and suffered heroically, but, alas! they have gone, and the breed seems extinct, or at least dormant, and the result is what we have announced. It ought to be added that the name of the venerable journal (*vox et præterea nihil*, to quote the Roman poet once more) will be enshrined as a sub-title in Professor M'Fadyean's Journal, and will thus attain to a conditional immortality. *Requiescat in pace.*

Royal College of Veterinary Surgeons.

10 RED LION SQUARE, W.C.,
December 1902.

FELLOWSHIP DEGREE.

A meeting of the Board of Examiners for this Degree was held on the 13th inst. Four candidates entered for the examination, and the following is a list of those who passed and duly received the diploma:—Messrs. F. G. Edwards, Chester; W. P. Weston, York; James Borrowman, Cupar-Fife; George Elmes, St. Albans, Herts. The Examiners were Professor J. Macqueen, Mr. William Hunting, and Mr. J. Malcolm.

ARTHUR WM. HILL, *Secretary.*

NEW VETERINARY COLLEGE.

AT a meeting of the Examining Board of the above body held in Edinburgh, consisting of Messrs. W. Woods, F.R.C.V.S.; J. Clark, F.R.C.V.S.; W. Hunting, F.R.C.V.S.; W. H. Bloye, F.R.C.V.S.; N. Almond, F.R.C.V.S.; Vet.-Lieut.-Colonel J. A. Nunn, D.S.O., C.I.E., F.R.C.V.S., F.R.G.S., F.R.S.E.; R. J. Hickes, F.R.C.V.S.; J. Blakeway, F.R.C.V.S.; Vet.-Major J. Meredith, F.R.C.V.S.; A. Wheatley, F.R.C.V.S.; W. Robb, F.R.C.V.S.; W. F. Peacock, M.D., F.R.C.V.S., M.R.C.S., L.R.C.P.; E. Wallis Hoare, F.R.C.V.S.; F. T. G. Hobday, F.R.C.V.S.; R. F. C. Leith, M.B., F.R.C.P.E.; George Dean, M.B.; J. B. Haycraft, M.D., D.Sc., F.R.S.E.; T. H. Milroy, M.D., B.Sc., F.R.S.E.; J. Reynolds Green, D.Sc., M.A., F.L.S.; H. Somerville, B.Sc., Lond.; J. M. H. Munro, D.Sc., M.R.C.S., L.R.C.P.; and J. R. Ainsworth Davis, M.A., F.C.P., F.Z.S.

The following candidates passed:—

Class "A." Examination.—Messrs. G. C. Cochrane,* J. G. Runciman, R. G. Wood, and W. Walker.*

Class "B."—Messrs. W. G. Darling, C. Elphick, and G. Petch.

Class "C."—Three years' "Theoretical."—Messrs. J. W. Bee and R. Elliott.

Class "C."—Three years' "Practical," and obtained their Diplomas.—Messrs. J. W. Bee, Sheffield, and R. Elliott, Middlesburgh.

Class "D." and obtained their Diplomas.—Messrs. L. W. Lloyd,* Abergele; C. H. Harrison, Manchester; J. A. Shaw, Redcar; A. Macfarlane, Aberdeen; A. B. Mattinson, Preston; Tom Walker, Blackpool; A. Walker, Dewsbury; G. H. Nicholson, Kirkcudbright.

* Second Class Honours.

ROYAL VETERINARY COLLEGE, CAMDEN TOWN.

AT meetings of the Board of Examiners held in London on December 12th for the Written, and on and between December the 15th and 17th for the Oral and Practical Examinations, the following gentlemen passed their Final Examination:—Messrs. J. G. Bush, A. Cornish-Bowden, N. Gilford, J. C. Hally, F. T. Hancock, R. E. Klyne, A. C. Lloyd, W. P. Loft, W. L. Little, W. E. Owen, F. O. Parsons, P. G. Short, C. H. Sheather, A. V. W. Sewell, F. H. Sugden, A. J. Thompson, W. F. Wilson, A. J. MacDonald, N. Edin.

The following passed their Third Examination:—Messrs. T. E. Burridge, E. T. Clemow, J. M'Rae Trost, *R. C. Glover, J. Holiday, J. T. M. Hughes. *W. G. Litt, T. A. Nicholas, *H. K. Roberts, J. Richardson, D. O. Turnbull, H. M. Williams.

The following passed their Second Examination:—Messrs. A. C. Anderson, R. S. Andas, P. T. Bolton, J. A. Bosley, L. L. Dixson, E. G. Haskell, E. S. Martin, H. Platt, J. M. Richardson, S. Speer, W. H. Townson.

The following passed their First Examination:—Messrs. A. K. B. Byles, L. S. Balls, *A. G. Doherty, R. L. L. Hart, *J. H. Jones, W. G. Blackwell, J. H. Jarvis, *R. W. Mellard, *E. R. Nicholf, G. B. C. Rees-Mogg, *G. C. H. Sharpe.

Those marked thus * passed with Second Class Honours.

DICK VETERINARY COLLEGE.

Class "A."—T. N. Critchley, C. L. O'Gorman, C. W. Rutherford, L. L. Steele, J. W. Sugden, J. A. Gault, and W. J. Young (second honours).

Class "B."—J. M'C. Barry, F. Drinkwater, J. R. Hayhurst, D. Hutch, W. F. M'Connell, and A. E. Massy (second honours).

Class "C."—G. W. Davidson, A. J. Horner, J. Henderson, and J. O. Powley.

Class "D." and qualified M.R.C.V.S.—Robert N. Lewis, Middlesborough; William Robertson, Gollanfield Junction, Inverness; J. H. D. Sarjeant, Little Hampton, Sussex; and J. D. Whitty, Tagoat, County Wexford.

GLASGOW VETERINARY COLLEGE.

"A." or First Professional Examination.—Peter M'Intyre, Greenock, and James Lawther, Crossgar, Ireland (second honours).

"C." or Third Professional Examination.—K. M'Kenzie, Lairg, Sutherlandshire; Walter Gardner, Helensburgh; Hector M'Intyre, Greenock; J. W. Tait, Bowling; and Roy Bickerton, Denny.

Final Examination (three years' course, and received the diploma of the Royal College of Veterinary Surgeons.—Samuel Craig, Londonderry.

"O." or Final Examination (four years' course, and received the diploma of the Royal College of Veterinary Surgeons.—Jas. Wallaee, Mauchline, Ayrshire; James Crooks, Belfast; Frank Timeny, Partick; and James MacFarlane, Inverness.

Original Papers.

AN ADDRESS ON THE TRANSFERENCE OF BOVINE TUBERCULOSIS TO MAN.*

(*Given at the International Conference on Tuberculosis in Berlin.*)

BY ROBERT KOCH, M.D., DIRECTOR OF THE INSTITUTE OF INFECTIOUS DISEASES IN BERLIN.

[We are indebted to Dr. R. Koch for a copy of the text of the address which he delivered in the course of the discussion on this subject opened by Dr. Kohler at the International Conference on Tuberculosis in Berlin on October 25th.

The following translation of this address will, it is believed, be read with interest.]

In the following communication I shall keep strictly to the subject appointed for discussion, "the transference of bovine tuberculosis to man," and not follow the example of most of the preceding speakers who have occupied themselves with the reverse question, the transference of human tuberculosis to cattle. It would lead me too far if I debated this question here also, but I reserve to myself the right of entering more fully into it in a short time, while I publish my further investigations on human and cattle tuberculosis.

* From British Medical Journal, Dec. 20, 1902.

On the whole I completely agree with what the Chairman has said. I too have been specially struck by the fact that the statistics of primary intestinal tuberculosis collected up to now are somewhat uncertain, and too much affected by contradictions to be turned to good account as evidence to determine the point at issue.

This form of tuberculosis is said to be specially frequent in England, according to the accounts of Woodhead,[1] Still,[2] and Shennan.[3] But English returns are not awanting according to which primary intestinal tuberculosis in this country is said to occur less frequently (according to Carr[4] only five times in fifty-three tuberculous children under two) or even very seldom.[5]

In America out of 369 children in New York, five (1·4 per cent.) were found with primary intestinal tuberculosis according to Bovaird.[6] In Boston, on the contrary, according to Councilman,[7] there were 37·1 per cent.

In Germany, as far as I have been able to find statements on the subject in literature, and as far as my personal inquiries have reached, all authors have expressed the opinion that primary intestinal tuberculosis is with us a very rare occurrence. The only exception to this is at Kiel, where Heller has found 37·8 per cent. of primary intestinal tuberculosis at necropsies of tuberculous children.

I can contribute the following facts to the critical examination of these circumstances. A year and a quarter ago the Board of Education issued invitations at my request to the heads of the university clinics in Prussia to render accessible to me such cases of primary intestinal tuberculosis as have incurred the disease ostensibly through the use of the milk of cows suffering from *Perlsucht*. The same invitation was issued eight months ago to the directors of the Institute of Pathological Anatomy of the Prussian Universities with regard to cases of primary tuberculosis of the intestines, the mesenteric glands, and the peritoneum, so far as the onset of the illness might be traced to the use of food affected with *Perlsucht*, from the histories of the disease or special facts ascertained. Herr Heller in Kiel received a special invitation of this kind.

But up to the present time neither from the hospitals nor from the Institutes of Pathological Anatomy has one single report reached me, so that I must, I think, conclude that at the Prussian Universities no case of primary intestinal tuberculosis has, within this period, come under observation which can be referred to the use of food affected with *Perlsucht*. Still, before this decree, Virchow placed at my disposal a case of primary intestinal tuberculosis, in reference to which he expressly noted that cases of the kind did not often occur—perhaps three or four times a year—at his institute. Perchance this is the same case—as I note, by the way—which Herr M. Wolff has reported on in the course of the discussion He stated that he had produced *Perlsucht* in a cow with tuberculous material which he had obtained from it. In my investigation of this case I have arrived at an exactly opposite result, for the pure culture of tubercle bacilli obtained from it showed itself quite non-virulent for cattle. I cannot enter here on the reasons why Herr M. Wolff and I arrived at such contradictory results. I must reserve the discussion of these for another occasion.

The striking contradictions already mentioned in the statistical data of primary intestinal tuberculosis most naturally depend on some such circumstances. Local differences do not appear to lie at the root of the

matter; at least, I have been able to make out nothing of the kind with regard to Kiel and the rest of Germany. There remains, then, scarcely anything else in which to seek the explanation but the uncertainty of subjective opinion as to what is understood by primary intestinal tuberculosis, so that many still apply this description to cases which others will not allow to pass as such. But we shall scarcely arrive at facts for consideration acknowledged on all hands as reliable till we have striven after agreement on this point.

Less full of contradictions are the assertions concerning observations of skin infection in veterinary surgeons, butchers, and slaughter-house employés related by the Chairman. There already exist a fair number of communications as to occurrences of the kind. I have myself had many opportunities of examining such cases.

They all have this in common, that after a wound on the hands or arms which has occurred while cutting up an animal affected with *Perlsucht*, wart-like formations—the so-called tuberculosis verrucosa cutis—develop. If the wound extends to a tendon it may in rare cases become a tuberculous inflammation of the tendon sheath. In isolated cases the process seems to have attacked the nearest lymphatic glands as well, but to a very slight extent. In the remaining cases the disease remains localised, does not lead to a tuberculosis of internal organs, and runs its course as an insignificant skin malady which often gets well of itself, as slaughter-house employés have assured me.

Up till now it has only in one case ever been held to lead to a general infection. This is the case recorded by Pfeiffer of a veterinary surgeon in whom tuberculosis of the lungs developed fifteen months after a wound of the finger, leading to death in the following eighteen months. At the necropsy, however, the axillary glands proved to be free from tuberculosis, and we must conclude from this that no connection existed between the wound of the finger and the tuberculous infiltration of the lungs. The question was only one of a casual coincidence between the *Perlsucht* infection—if it existed at all, and even this is not proved—which remained local, and an infection of the lungs from another quarter. Bearing in mind the extraordinary frequency of primary tuberculosis of the lungs, a coincidence such as this with tuberculosis verrucosa cutis must occur incidentally now and then.

A new case of the same kind almost insinuated itself into the literature of the subject a short time ago. A veterinary surgeon in Berlin is said to have injured his index finger at the necropsy of a cow infected with *Perlsucht*, to have become phthisical in consequence of this, and to have died of hæmoptysis. Inquiries instituted at once elicited that the man in question came of a tuberculous family, and before wounding his finger showed undoubted signs of tuberculosis of the lungs.

Again, a case communicated by Hartzell [8] cannot even stand the mildest criticism. A labourer had received a wound on the back of his hand while repairing a cattle truck. Warts subsequently developed, and he died a year later of tuberculosis of the lungs. Every proof of connection between the two affections is wanting here. It is not even stated whether a necropsy was made. Still more insufficient is the statement contained in the same work by Ravenel that the death of Mr. W., of the Royal Veterinary College of Edinburgh, was attributed to an infection which he contracted at the necropsy of a cow infected with *Perlsucht*.

With the best will in the world there is no doing anything with such defective information towards clearing up the question considered here. It is better to leave it on one side and look out for really conclusive observations.

Baumgarten's communication concerning the cancer patients inoculated at Königsberg with virulent *Perlsucht* bacilli I consider, on the contrary, very important. It is a question of an experiment under trustworthy observation in all its bearings and throughout its whole course; and since it is recognised as proved that no antagonism exists between cancer and tubercule, the negative result of this investigation only points to the fact that the *Perlsucht* culture in question possessed no virulence for man in subcutaneous injections.

In all investigations which aim at solving the question of the transference of bovine tuberculosis to man through statistics of primary intestinal tuberculosis and observations on skin infection in man, we must be clear that the evidence with which we have to deal is always indirect. For of the cases on which statistics are based we know that in the most favourable event they are genuine cases of primary intestinal tuberculosis, but not whether they really depend on *Perlsucht* infection, and not far more on human tuberculosis, with which, on account of its extraordinary frequency, we have to reckon in every single case.

Even the occurrence of a *Perlsucht* infection, which remains local, as a result of a skin wound, does not in any way prove that *Perlsucht* bacilli are also in a position to infect the uninjured intestinal mucous membrane, or if they are able to pass through it without leaving any traces behind; that they render the mesenteric glands tuberculous, and from thence bring about a general infection of the body with its well-known and justly feared consequences.

On the other hand, we cannot but expect that if tuberculous infection through partaking of meat and milk infected with *Perlsucht* really occurs as frequently as is asserted, direct observation must make this obvious.

This side of the question has, in my opinion, been much too little regarded up to the present, and it is very necessary that we should turn our attention once again in this direction. Analogous considerations are not wanting in this connection. There are several other infectious diseases which are conveyed to man by feeding on meat and milk, and their behaviour may be very instructive to us in relation to tuberculosis.

I recollect in this connection the so-called cases of meat poisoning which have been largely caused by a typhoid-like bacillus, and also the illnesses resulting from the use of the flesh of animals which had suffered from splenic fever. Milk, too, may contain typhoid bacilli, as has been so frequently observed in recent times, and these give rise to an outbreak of enteric.

It is extraordinarily characteristic of all these outbreaks that they do not occur as isolated illnesses, but in groups and often in epidemics. This could scarcely be otherwise, for the milk of a cow, the flesh of a sick animal is practically always partaken of by several, and often by a great many people at the same time, who will be infected and fall ill, certainly not as a whole, but on a larger or smaller percentage.

Not only is attention directed to the infection which has taken place, and to its common cause, by the number of cases of illness of the same kind, but incontestable evidence arises thus that the food in question must

have contained the infectious material. Under such conditions no statistics and no experiments on animals are required; the observation itself yields us direct proof of the occurrence of the illness from the use of infected food.

A tuberculous infection must also take shape in the same way if tubercle bacilli which are virulent for man are found in meat or milk. Here, too, a certain percentage of people who have taken the infected food must fall ill, and a group of illnesses must occur.

Of course the circumstances will differ to some extent in the case of tubercle and that of typhoid; for, owing to the much longer incubation period of tuberculosis, the illnesses will not arise so soon after infection or be comprised within so short a space of time. But, on the other hand, tuberculous infection is favoured by the fact that the ingestion of tubercle bacilli is repeated many times, and extended over a long period among those people who are given to the use of food infected with *Perlsucht*, so that the probability of the outbreak of infection must be essentially raised.

Everything, then, combines to show that tubercle also—if as a fact it can be produced by the flesh and milk of animals suffering from *Perlsucht*—must occur in groups, and it is only a question whether this has not for a long time been observed and described.

[B. Fraenkel has since drawn my attention to the fact that he expressed a similar opinion in his work on tuberculosis in the *Gerhardt Manual of Diseases of Children* before the discovery of the tubercle bacillus. He at that time maintained the opinion that tuberculosis could not be conveyed by the milk of cows suffering from *Perlsucht*, and gave as his reason that he had never observed that several children in one family suffered at the same time from tuberculosis, which would necessarily be the case if the common milk-can furnished the cause.][9]

Let us next examine the literature of the subject for communications concerning illnesses following the ingestion of meat infected with *Perlsucht*.

But I should like to draw attention beforehand to the fact that probably not only meat free from tubercle and certainly boiled or well roasted, is eaten as is usually supposed. On the contrary, an expert on meat inspection, Ostertag,[10] says of this: "Day by day an uncounted number of tuberculous organs come into the market and are consumed." They are mostly made into sausages. Only a short time ago I had to express an opinion as an expert witness in legal proceedings about a case in which meat, infested with *Perlsucht*, which had been delivered without his knowledge at the business house of a court meat purveyor, was only by chance prevented from being made into sausages. Although, then, no doubt can exist that a short time ago, from deficient meat inspection, much meat infected with *Perlsucht* reached the market and was often enough eaten, yet in the whole literature of the subject not a single observation of groups of illness or epidemics, in consequence of the ingestion of meat infested with *Perlsucht* can be found. But still more, not even once is an isolated case of illness described, and reports on damage to health from meat infested with *Perlsucht* are equally wanting.

On the contrary, facts are recorded by several authors which prove the opposite. According to Bollinger,[11] a collective investigation instituted by the order of the Bavarian Government yielded a number of isolated observations which speak for the harmlessness of the flesh of tuberculous animals. Many families, even whole villages, were found which consumed tuberculous meat as a matter of course without tuberculosis occurring more frequently

among them than elsewhere. Göring[12] and Schottelius[13] have had quite similar experiences.

In consequence of this a very lenient opinion prevails with regard to the danger of meat infected by *Perlsucht*. At the Congress on Tuberculosis in Paris in 1885 and 1891 the complete exclusion of the flesh of tuberculous animals as a class was decided on. But at the Congresses of 1893 and 1898 a more rational opinion was arrived at, and the sale of the flesh of animals in which tuberculosis was only local was considered permissible. At the Seventh International Congress on Hygiene in London the complete exclusion of tuberculous meat was unanimously set aside. Ostertag, an energetic champion of the identity of bovine and human tuberculosis, says, in his handbook of meat inspection (1899): "In face of the rare occurrence of primary intestinal tuberculosis in man and the wide dissemination of bovine tuberculosis, only a very slight risk to the health of mankind can be empirically attributed to the flesh of these animals."

The same standpoint is taken by the highest authorities in Prussia. From a circular decree from the Ministers of the Interior, of Agriculture, of Medical Affairs, and of Commerce and Trade, dated March 26th, 1892, I quote the following:—"Since attempts on a large scale and carried on for some years at the Berlin Veterinary College and several Prussian universities to produce tuberculosis in animals by feeding them on the flesh of other animals affected with *Perlsucht* have given an essentially negative result (opinions of the scientific deputation for the Faculty of Medicine from December 1st, 1866), the transference of tuberculosis from the use of meat which is even infected with tubercules is not proven, and the flesh of well-nourished beasts cannot be considered as a rule less valuable, even if (tuberculous) illness exists, nor can its sale be placed under special police supervision."

From all this we gather that proof of the danger of meat infected with *Perlsucht* is completely wanting; it is, as the Ministerial decree expresses it, "not proven."

But no one will contest that the *Perlsucht* bacilli in meat are identical with those occurring in milk, and an insoluble contradiction exists in the fact that far stricter views have prevailed recently against the milk of tuberculous beasts than against tuberculous meat.

Now, how goes it with regard to the direct proof of the danger of the milk of animals suffering from *Perlsucht*? *Perlsucht* bacilli contained in milk also come into the market to a considerable extent, and are taken in a living condition much more frequently than is usually accepted. Next, it should be observed that 1 to 2 per cent. of all milch cows suffer from tuberculosis of the udder, and without exception yield milk containing more or fewer bacilli. But tuberculosis of the udder is not of such a character that it can be recognised as such from its earliest onset. If one watches the disease and allows a tolerably certain diagnosis to become possible, it will have existed for weeks and even months, and all this time the milk with its *Perlsucht* bacilli will have been drunk. Such milk will scarcely ever be used by a single individual. As a rule it will be mixed with the milk of several other animals from the same byre, and be ingested by a still larger number of people. If the milk reaches a central dairy it may be divided amongst hundreds of consumers.

In regard to the last event I cannot share the view of Nocard, that milk may become less infectious from dilution and the *Perlsucht* bacilli finally quite inert. If it were a question of a poison in solution this

assumption would be justifiable. But here we have to do with micro-organisms which can only be separated, not diluted, but then come into contact with all the more people, and—if they are virulent, for them—become all the more dangerous.

Now people usually rely on the fact that *Perlsucht* bacilli are killed by boiling the milk, but in this respect they make a great mistake. To be sure, if in a laboratory experiment milk is brought to boiling-point, all the *Perlsucht* bacilli are destroyed. But in the household method of boiling milk they remain alive. Professor Beck [14] has, at my instigation, instituted numerous and important investigations on this point at the Institute for Infectious Diseases, and has found that tubercle bacilli are not killed by a single, short boiling up of milk in wide-mouthed vessels—the treatment milk usually receives in a household. To attain this object, uniform boiling for several minutes is necessary, and this the housewife will not condescend to do because the milk easily boils over or gets burnt. If, therefore, any one asserts that he imbibes no living *Perlsucht* bacilli because he only drinks boiled milk he has still to produce evidence that the milk taken by him is always kept boiling for several minutes.

Again, one cannot absolutely rely on the sterilising apparatus used in the larger dairies. As long as it is used according to regulations and carefully superintended, most apparatus of this kind may certainly fulfil its object, but as soon as the necessary care is once temporarily wanting, the infectious material perchance present slips uninjured through it, as the numerous typhoid epidemics which have originated from such dairies show.

One other point I might draw attention to, one which almost always remains unnoticed in discussions on milk infected with *Perlsucht.* We are not only concerned with the milk, but also with the products which are made from it, especially with butter, which evidently very frequently contains living *Perlsucht* bacilli. It has frequently happened to me that persons who vehemently protest that they have only used boiled milk for years because of the danger of *Perlsucht*, when asked what they did about the butter, confessed that it had never entered their heads, that in the natural order of things this should be sterilised too.

Under such circumstances I believe I am justified in asserting that certainly almost every one in the course of his life has more or less often, and in considerable numbers, ingested living *Perlsucht* bacilli. If *Perlsucht* bacilli are really dangerous to man we might logically expect that instances have been very frequently observed and described of injury to health, which have been unquestionably caused by milk infected with *Perlsucht.* I have looked at the literature bearing on the subject, and believe I can assert that nothing essential has escaped me. Instead of the countless cases on which we ought to reckon, I have been able to find among them all only two groups of illnesses and twenty-eight isolated cases of illness, and we must, moreover, consider whether as pieces of evidence they are really free from objection.

Thus the next thing to discuss is the celebrated and constantly quoted case of Ollivier which he communicated to the Académie de Médecine on February 24th, 1891. In a girls' school, in the course of a few years thirteen pupils sickened with tuberculosis, six of whom died. In several cases the intestinal canal seemed the starting-point. When the cause was sought it appeared that a cow which had been kept for some years in the establishment of the school suffered from tuberculosis of the udder, and that the

milk had been drunk by the boarders. This indeed looked just as if a group of illnesses had occurred in consequence of the use of milk infected with *Perlsucht*, and that here a case of *Perlsucht* infection was found which was free from objection. Ollivier was of this opinion, and so have been all those who up to the present time have turned this case to good account a classical example of infection through milk containing *Perlsucht* bacilli. Yet the case is by no means so free from objection as has been maintained, for, apart from the consideration that apparently only one necropsy was made, and that the diagnosis of alleged intestinal tuberculosis is somewhat uncertain, people have contented themselves with excluding heredity as a cause from another quarter which comes under consideration. A direct infection from one person to another has not been publicly brought under consideration at all, and yet the course of this little epidemic of tuberculosis would have been exactly the same if one of the boarders or a pupil had suffered from tuberculosis of the lungs, and infected a number of her companions through the sputum. Something of the kind has often occurred, and its possibility would have to be considered among all the circumstances. But, even apart from this consideration, the alleged classical case vanishes away, and even proves the reverse, as the result of a second communication by Ollivier which he found himself obliged to make at the next session of the Academy, in consequence of better information. He actually had to declare that he was mistaken; that the milk from the cow in question was not drunk by the boarders, but by the teaching staff and the domestic servants of the establishment. Among those persons who had regularly partaken of the suspected milk not a single case of tuberculosis had occurred.

If, in spite of this correction, Ollivier's case is still used by defenders of the identity of human and bovine tuberculosis as a proof, they show in what a one-sided and uncritical way they go to work to procure their evidence.

I come now to the second example of a group of illnesses. This was published by Huls in the *Münchener medizinische Wochenschrift* a few months ago. In a miller's family of nine persons, who are alleged to have fed for years on the milk, butter, and meat of tuberculous animals, and in other respects are said to have had no opportunity of infection, seven members died of consumption. In this case we need only pay attention to the succession of the fatal cases to see at once that the connection is quite different from the one accepted by Huls. First the mother sickened, but recovered again after some months. In the following year the youngest child sickened and died. In the same year a son, aged eighteen years, became ill and died. A year later followed a son, aged twenty-three years. In the next year the mother got ill again and died; then followed a girl of sixteen, then the father, and, lastly, a third son. That, among the relations of the illness to the family here indicated, contiguity, the dwelling together of the sick and healthy, and so the transference from one to another should be excluded, is to me incredible. Every expert in infectious diseases will be convinced without any further evidence that there was in this case a continuous chain of contact infections, and not a group of illnesses arising from infected food. In order to be able to accept the last as the origin the illnesses must have ensued in the course of six months or a year at least; they could not, as was the case here, be protracted over a series of years. So this case of a group of illnesses also comes to nothing, and there only remain the twenty-eight cases of isolated illnesses.

These do not merit any great confidence in and for themselves. Should we allow a single typhoid case, in which the use of suspected milk could be proved, to pass without further investigation? We certainly should not. Notwithstanding, I neither can nor will contest the possibility that single cases may occur. But in order to be convincing they must fulfil certain conditions. These conditions are as follows :—

(1.) Certain proof of tubercule in general, and, where possible, the primary focus must be supplied. In adults we must, therefore, require the existence of unassailable clinical symptoms, and a necropsy when these are not present. In children the clinical symptoms are much too uncertain, and so a necropsy is always requisite with them.

(2.) Other sources of infection must be excluded with certainty. The assurance that the person in question comes of a healthy family is under no circumstances sufficient. There are numerous other possibilities of infection either inside or outside the family which come up for consideration. In this connection I can only agree with the Chairman, who has drawn attention to the researches of Preisich and Shütz, and of Dieudonné on the occurrence of tubercle bacilli round the nails of children, and thus to a source of infection in children well worthy of heed.

(3.) In each case of alleged infection from milk affected with *Perlsucht* the condition of the rest of the people who have taken the same milk should be borne in mind. These fellow-consumers form to a certain extent a control experiment, and if of the numerous people who have drunk the suspected milk only a single one sickens, this weighs decidedly against the belief that this one person was infected by the common food. With enteric, too, if only one of all the people who had drunk the same milk contracted typhoid, we should on this ground alone immediately relinquish the suspicion that it could depend on a milk infection.

(4.) The source of the milk should be attended to. Since in recent years it has become more and more evident that milk containing tubercle bacilli is yielded only by such cows as suffer from tuberculosis of the udders, the general statement that some one has drunk milk from a cow suffering from *Perlsucht* no longer suffices to prove to us that *Perlsucht* bacilli have really reached his digestive organs. A man can certainly ingest milk from a cow suffering from *Perlsucht* without coming into contact with *Perlsucht* bacilli through it. It must be milk from a cow with tuberculosis of the udder, and therefore a statement on this subject should not be wanting in a report on milk infection if it is said to be complete.

If I now examine in this way the twenty-eight single cases I have collected from literature, and see how far they correspond to the conditions just laid down, I come to the following results :—

(1.) In only ten cases it is stated that a necropsy took place, and only seven of these are said to have had intestinal tuberculosis.

(2.) Only in three cases is it asserted that the milk came from a cow with tuberculous udders.

(3.) In not a single one are other possibilities of infection excluded with certainty. As a rule only absence of heredity is alleged, though we know that just this plays a very subordinate part if any.

(4.) In no case is anything stated about the condition of other people concerned.

The insufficiency of these data has not even entirely escaped those who use them. Thus Ravenel says,[15] "The number of cases in which infection can be traced back to the use of tuberculous milk is not great (it would be

more correct to say, 'is, contrary to the expectation, small'), and almost all are open to the objection that all other sources of infection cannot be completely excluded." And in the report of a Committee of the American Public Health Association,[16] which is distinguished in other respects by the observance of a strikingly biassed point of view, it is confessed that we cannot tell from the recorded cases whether the illness was caused by the *Perlsucht* bacillus. But in spite of this confession, the collected cases are treated as if they were incontrovertibly proved.

It therefore appears to me necessary to mention shortly some of these cases, and particularly those among them which are regarded as quite certain and have attained thus to a degree of celebrity.

I begin with the case of Gosse, which Nocard[17] has recorded. Dr. Gosse, a Genevan doctor, regularly resorted with his family to a farm on Sundays, where his granddaughter, seventeen years old, drank by preference milk straight from the cow. The young girl sickened, and after a long illness died of intestinal tuberculosis, as necropsy showed. On this an investigation was set on foot, which showed that of the five cows on the farm four were tuberculous, and two of the latter actually suffered from tuberculosis of the udder. This fact was considered sufficient to base on it the assertion that the illness and death of the young girl must have been caused by milk infected with *Perlsucht*. The possibility of the infection arising in any other way is nowhere discussed, and yet during her permanent residence in town she must undoubtedly have had sufficient opportunity of being infected from some other quarter. We must further ask, what became of these people who drank the rest of the milk which came from the farm. The inhabitants of the farm had undoubtedly done so. Have any of them become ill? Had this been the case we should have been made acquainted with it at once. As this has not happened we must consider that no one else became ill, and we are further urged to the logical conclusion that the milk in question was not injurious to health, and cannot be blamed for the illness of Dr. Gosse's granddaughter. Nocard, who introduced the case into the literature of *Perlsucht*, was of the opinion that it had almost the value of an experiment. I do not believe that this distinguished expert in tuberculosis, who knows quite well with how many precautions and how carefully experiments on tuberculosis must be carried on, in order to satisfy our present-day scientific demands, would still maintain the opinion. Still less sound than the case just mentioned is the one which Dr. Stang observed in Amorbach. This is described by Bollinger.[18] A five-year-old boy suffered from dropsy, and died with the symptoms of consumption. At the necropsy, tuberculosis of the lymphatic glands of the abdomen and of the serous membranes and lungs was found. With regard to the etiology of the case, it was elicited that no tubercle had occurred in the family for two generations, and that the boy for a year had drunk the milk of a cow affected with *Perlsucht*. This case too, Bollinger says, may be compared to an experiment, but besides the same critical considerations which had to be raised against the preceding case, there is this in addition, that we cannot ascertain whether the cow suffered from tuberculosis of the udder. Furthermore, the boy had tuberculosis of the lungs, as well as of the mesenteric glands and peritoneum, and it would have to be fairly established that this was not the primary lesion, as is so frequently the case.

In the often quoted case contributed by Johne,[19] we only learn that a

child two and a half years old, whose state of nutrition had been enfeebled by measles and bronchial catarrh, died of miliary tuberculosis of the brain. He had been fed with milk from a cow infected with *Perlsucht*. Whether a necropsy was made, whether other possibilities of infection were excluded, whether the cow suffered from tuberculosis of the udder, whether other people who had drunk the same milk had sickened, is not stated.

According to Uffelmann [20] a child died after partaking of the unboiled milk of a sick cow, of tubercles which developed in the subcutaneous tissues. Neither in the case of the child nor the cow was a necropsy made. Uffelmann himself assigns no evidential value to this case, yet in spite of this it is regularly brought forward in literature when the point at issue is to prove the danger of the milk of cows suffering from *Perlsucht* from cases occurring in practice.

Some reporters [21] have even said that children while they took milk from a cow suffering from *Perlsucht* were sickly, suffered from eruptions and coughed, but soon recovered again if the milk from healthy cows was given to them. Such cases naturally prove just the opposite from what they are meant to prove, namely, that milk infected with *Perlsucht* was drunk by children for a long time without their becoming tuberculous.

The rest of the cases are like those just enumerated.

We come then to the conclusion that not one single observation free from objection can be cited of the injurious influence of milk infected with *Perlsucht* any more than for the harmfulness of meat affected in the same way, though numerous people continually expose themselves to the supposed danger.

But for milk infected with *Perlsucht*, as with meat, there exist observations of the fact that people have for a long time drunk it with no ill results. To be sure, the statements on this point are not numerous, evidently because it was much more interesting to look for infection, while none bothered themselves about the absence of infection.

Yet it would be easy in a short time to collect serviceable material. In the country where relations are clear it would only be necessary to have cases of genuine udder tuberculosis, and to ascertain how long the illness had existed in the animals; what people, especially children, had partaken of the milk and the butter made from it; whether, and how, the milk was boiled; and whether the persons concerned had fallen ill of tuberculosis in the course of one to two years; and, of course, the form which it took.

Very numerous letters have reached me in the course of the last year from people who have told me that they themselves or their belongings had drunk unboiled milk affected with *Perlsucht* for a long or shorter time, and had remained healthy. As it is not now possible to examine these cases as to their accuracy, I will not enter upon the matter; but I should like to request the International Committee to bring its influence to bear, so that instead of the quite unserviceable material now existing, reliable observations should be collected, including of course—

1. Cases of alleged infection from ingesting milk infected with *Perlsucht*, having regard to the conditions advanced by me (necropsy, exclusion of other sources of infection,condition of other people who have drunk the same milk, proof of tuberculous udders).

2. Cases of absence of infection after partaking of milk infected with *Perlsucht*, likewise under the control of the required conditions (proof of udder tuberculosis, sufficiently long observation of the people, statement as to whether and how the milk was boiled).

Provisionally we can only say that the injurious effects of milk infected with *Perlsucht* and its products are not proven. What these facts signify in relation to the immensely frequent opportunities of infection, I leave to the individual judgment.

Obviously this opinion only holds good in the case of mankind. It is a matter for agriculture and veterinary science to determine how far milk infected with *Perlsucht* is detrimental to cattle, and what measures should be taken to combat the danger which perhaps exists. Measures concerning meat and milk infected with *Perlsucht* which are meant to combat human tuberculosis cannot be well founded at the present time. Further, such measures would be very costly, because of the compensation which would have to be paid for animals judicially seized, and on account of the immense quantity of milk which would have to be inspected. It is, however, decidedly more fitting not to lay out a sum of this kind for something which is far from being established, but to apply it rather to such measures as must with certainty lead to a decline of human tuberculosis.

In this connection I can only repeat what I said in my London address: The fight with tuberculosis must not be fought on wrong lines if it is to have a real resul.. It must aim at shutting off the chief, indeed we may say almost the only, source of infection. This is those consumptives who in consequence of the unfavourable conditions under which they live, or because they obstinately set aside the simplest rules for the prevention of infection, are a danger to their companions. In some way or other we must look after these sick people, either by procuring for them more favourable conditions, for example, as regards dwelling-places, or by so sheltering them in suitable institutions that they cease to be a danger to their neighbours.

After the experiences we have had of other infectious diseases, we must come to the conclusion that in no other way can anything be attained, and therefore I should like urgently to advise that for the future this task should be kept to the fore in the battle against tuberculosis until it has been accomplished.

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ENLARGEMENT OF THE DISTAL END OF THE SMALL METACARPAL BONE.

BY CAPTAIN MARRIOTT, F.R.C.V.S., A.V.D.

SOME few years ago Vet.-Lieut.-Colonel Nunn described this disease, which to me was something quite new. Since then I have had rather an unfortunate experience, as two horses of my own suffered from this very rare form of lameness, and although I have nothing new to add, a short history of these two cases might induce others to give their experience of the above disease.

Case I.—Subject an Irish mare—by Revenge, dam by Lanark—twelve years, 15-2½ hands, a good type of a thirteen-stone hunter, fast, bold, brilliant fencer, and extremely clever. She carried me six seasons and gave me two falls only—one of which was not her fault. Towards the end of the season 1897 I noticed the day after hunting that the near fore-leg was slightly swollen on the inner side, just above the fetlock joint, and that she was going rather short on it. A sweating bandage was applied and the swelling disappeared in three days. The next time I rode her I noticed she was somewhat clumsy, and the following day the swelling had returned and extended half-way up the large metacarpal and back over the inner border of the perforatus tendon. The lameness was most distinct now. This time it took a week to remove the lameness, though some of the swelling still remained. The next time I hunted her she was so clumsy that she was all but down with me at every fence. The following morning she was very lame, with more swelling than ever, and not only the near fore but the off fore was similarly affected, but in a lesser degree. These swellings had not the characteristics of a sprained tendon or ligament, simply a tense, hard, painful swelling, and if I had been called on to state exactly what was the matter, I should have had to own that I did not exactly know. My leave having expired I had to return to duty, so I left this mare with a farmer, having fully made up my mind that she was completely useless except for breeding purposes, and I did not see her again for four months.

But when I next saw her there was no doubt as to what had caused the lameness and swelling. The tendons and ligaments were perfectly normal, but the distal end of the small metacarpal was fully twice its normal size, the enlargement extending up to where the small metacarpal bone articulates with the large, and probably higher. This mare was destroyed last October. She has bred me four foals by thoroughbred horses, and just out of curiosity I will take particular notice as to whether there is anything hereditary in this disease.

Case II.—Subject brown gelding, Lord of Rosna, by Lowland Chief—Lady Burghly (thoroughbred), eleven years, 15 hands. This horse had been exported from England to Malta, and thence to Egypt. I bought him the end of 1899. His racing record in Egypt was distinctly good, he had won many races, and I may here remark that he had won carrying 13 stone 10 lbs., which the handicappers had kindly given him to bring him back to the other horses. Nevertheless his legs were of the very best, and not a trace of wear about them. He won me three races in 1899, two in 1900, and in January 1901 he came out lame on the near fore-leg the morning after a training gallop. There was slight swelling on the inner side just above the fetlock, extending to the inner margin of the perforatus tendon. The

swelling and lameness disappeared after a week, and the horse resumed his training. In the month of February he won a race, but pulled up so lame that he could hardly hobble back to the weighing-room. Next day there was much swelling extending half-way up the large metacarpal and including the back tendons, and I thought the horse was completely broken down. However, with treatment the lameness and swelling disappeared, more or less. After a long rest of seven months the horse was put to work again, with very unsatisfactory results—sometimes lame, sometimes sound. The first fast gallop was sufficient to lame him, and various were the opinions given as to the cause of lameness. When riding the horse he would frequently falter on the near fore, and gave one the idea that he had trodden on a sharp stone. Towards the end of May 1902 I detected a most distinct enlargement of the distal end of the inner small metacarpal, not so large as in Case I., but nevertheless distinctly larger than that of the off fore. This to my mind was the cause of all the trouble, for the ligaments and tendons were perfectly free from enlargement. The horse was now put to slow work, but even at that he failed to keep sound many days together, and in the end had to be destroyed, and I regret I had no opportunity of making a post-mortem examination.

When we compare these two cases, they are very much alike as regards the age, both being well-bred horses, and the in-and-out kind of lameness, but differ considerably in the rate of development, for whereas one took roughly four months, the other took a year and four months.

RABIES IN THE HORSE AND ITS PREVENTIVE TREATMENT.

So far back as 1881 Professor Galtier stated that intravenous inoculation of the saliva of rabid animals did not provoke rabies in the sheep and horse, but seemed to produce immunity. This was confirmed by Nocard and Roux, who showed that intra-*venous* injection of pure bulb-virus in the horse, ox, and sheep 24 hours after the intro-*ocular* inoculation of virulent marrow sufficed to prevent an outburst of rabies. They further stated that, on account of the longer time required for incubation, and the less severe nature of inoculation by bites, good results might be hoped for even when the bitten animals were treated 3 to 4 days after the bite. The first known application of the prophylactic treatment was that by Moncet in the case of three cows which had been bitten by a rabid dog. These animals were inoculated 94, 79, and 118 hours after the bite and all three remained unaffected. Another veterinary surgeon treated an ass which had been bitten on the upper lip, but the animal died although it had received 16 cubic centimetres of brain-solution into the jugular four days after the bite. M. Conte, chief of the veterinary staff of the department of Herault (France), gives in the *Revue Vétérinaire* some results of his experiments in this direction, which are as follows:—

For inoculation is used 5 cubic centimetres of virulent emulsion prepared in the following way. Fragments of the bulb of the rabid dog are rubbed down in water which has been brought to boiling-point and then cooled, until the fluid is such that it can be easily taken up by a syringe after being filtered through fine linen. The jugular furrow must be care-

fully disinfected and then the injection made; 24 hours later the other jugular is injected, and thereafter the animal is left in complete rest for a month.

Horse No. 1 was bitten by a rabid dog on 27th December 1899. Rabies in the dog was proved by post-mortem examination and experimental inoculations. Two bites were found on the horse, and these were on the upper-lip, about 2 centimetres in length. The horse was inoculated on 2nd and 3rd January, but died six months afterwards. The local surgeon who had charge of the case stated that the animal had shown *paralytic* symptoms.

Horse No. 2, belonging to a different stud, was bitten by the same dog on the same day in the right hind-quarters, but the wound was never exactly discovered: the animal was inoculated on the 4th and 5th January. On the 21st May 1900 (84 days after the bite and 77 after the treatment) the first signs of rabies were found on the, until then, apparently healthy animal. These appeared quite suddenly, and took the form of increasing difficulty of locomotion. The gait became staggering, the feet were moved cautiously forward, and the action resembled the forward movement of a deer; then the crupper sank and the horse fell down at the stable door. After a pause of a few hours, during which the above symptoms had disappeared, the animal was again attacked more violently; it could hardly move, even standing was difficult and of short duration. Sweat covered the hind-quarters, the abdominal muscles contracted spasmodically, and the skin was excessively sensitive. The neck was very sensitive and painful to the touch, and the animal resisted pressure on the larynx. Appetite had almost disappeared; at times the animal would pick up eagerly a straw or two and bite them convulsively. The otherwise quiet and gentle animal became at times and suddenly ferocious, but on the other hand the sight of a dog, the presence of strangers, and touching with the hand produced no reaction. On the second day of its illness the paresis of the hind-quarters increased, standing was of shorter duration, lying almost permanent, but the animal, now stretched almost motionless on the ground, occasionally made efforts to rise, and sometimes successfully. Appetite lingered on and fodder was torn voraciously from the rack and swallowed eagerly. Towards evening of the second day excitement increased. Head and extremities were the seat of pendulum-like movements, the skin was extremely irritable, especially on the belly; when touched in the slightest way there was violent resistance and paroxysms. For a few seconds the animal appeared to be sleeping, then woke suddenly up, tried to raise itself on its fore-legs, and throw itself on anything near, at the same time neighing loudly. Death took place on the third day. Unfortunately no proper post-mortem could be held.

Horse No. 3 was bitten by a dog on 16th June 1900, at the same time as three oxen, ten sheep, and three swine. The bites, five in number, were on the lips and nostrils, and were from 1 to 4 centimetres in length. The dog disappeared, but its rabid state was proved by the death from rabies of one of the oxen and three sheep. Treatment took place on 21st June, 108 *hours* after the bite, with inoculative matter from Montpelier; 205 days later the animal became ill with all symptoms of rabies, and death took place on the fourth day after. In this case also the post-mortem was incomplete.

Horse No. 4 was bitten on 22nd May 1901 by a dog which was proved

by experiment to be rabid. The four bites were on the upper lip. Inoculation took place 76 hours after the bite. Up to 14th October the animal appeared to be healthy, but on that day it refused its fodder; next morning its gait was unsteady and at every movement the animal threatened to fall. It was dejected and insensible to external influences. Sweat covered its fore-quarters, and there was slight colic. Paralysis followed on paresis, and on the 16th the animal fell down and never rose again. Death took place on the 20th, 145 days after the bite. Rabies was proved by post-mortem examination and control experiments.

Horse No. 5, inoculated in the same way as the others, was withdrawn from M. Conté's observation 71 days after the bite.

All these horses, except No. 5, whose fate was unknown, died of rabies. For the three first the objection may hold good that inoculation took place too late, namely, 5 and 7 days after the bite, that is, 24 to 72 hours later than the time recommended by M. Nocard as the extreme limit. The fourth case, in which inoculation took place 72 hours after infection, shows that even this interval was too long. We must conclude that when the wounds are in the lips and nose preventive efficiency can be hoped for only when inoculation takes place immediately very or shortly after infection. But if this is the case the practical applicability of the treatment is reduced to zero. It is to be noticed that in the second, third, and fourth cases (No. 1 is uncertain) death took place 84, 200, and 145 days after inoculation, whilst as a general rule death from rabies takes place, in the case of solipeds, in 14 to 60 days. Thus it appears that inoculation was able to *defer* the symptoms of the disease and increased the animal's power of resistance. Increase in the dose might therefore give validity to M. Nocard's theory and make it of practical utility.

CENTRAL VETERINARY MEDICAL SOCIETY OF FRANCE.

Session 1902.

We fancy that the Secretaries of most Veterinary Medical Societies will bear us out when we say that there is the greatest difficulty in getting contributions or papers from the members, and judging from the list they seem to do this better in France, many of these communications being most valuable additions to veterinary science. There must be some cause for this dearth of original records; we are loth to believe that English veterinarians are incapable of providing it, or are too apathetic. Possibly a stimulus is required, and the French plan may be worthy of consideration, as with but few exceptions is work done for its own sake. No doubt it ought to be, and as the copy-books of our youth informed us, "Virtue is its own reward," but unfortunately human nature is frail, and every one works better if there is some tangible reward in sight for his exertions, that will remain as evidence of what he has done.

We would suggest to the various Veterinary Medical Societies that at the close of the session a ballot be taken, "of course excluding competitors," and one or more prizes or momentoes be given for the best papers produced during the session.

It may be said that the funds will not allow of this, but it is not the extreme value that is appreciated, and the cost of a silver medal or even an

illuminated parchment certificate is not great; furthermore, most Veterinary Medical Societies appear to have funds enough for an annual banquet. Foreigners often reproach us by saying that they devote the spare cash of the nation to science and education, but in England it goes in religion and eating and drinking.

LIST OF PRIZES AWARDED.

PRIX PAUGOUÉ.

Authors.	Subject of Paper.
Dr. Ablaire, Vétérinaire en 1er au 3e Hussars.	Epiphora. Catheterism and surgical treatment of the lacrymal duct in the domestic animals. Anatomical and surgical study of the parts.
M. Lebrun, Percy (Manche).	Manual of practical veterinary obstetrics.
M. Lucet, Courtenay (Loiret).	Generalised emphysema of the fœtus.

PRIX PAUGOUÉ (SPÉCIAL.)

M. Berton, Vétérinaire en 1er au 3e Regiment d'Artillery (Castres). M. Vivien, Vétérinaire en 2e au 5e Hussars (Nancy),	Etiology and pathology of bony tumours in the horse, with specimens and photographs.

GOLD MEDALS.

M. Deysine, Vétérinaire en 1 au 7e Dragoons (Fontainebleau).	Median neurectomy.
M. Huguier, Vétérinaire en 2e au 1er Regiment of Chasseurs (Sousse Tunis).	Sheep-breeding in Tunis.

SILVER MEDALS (LARGE.)

M. Leon Bedel, Dozule (Calvados).	Notes on veterinary obstetrics.
M. Pérussel, Pontanevaux (Saône et Loire).	Diary of a practitioner.
M. Sarrazin, Vétérinaire en 2e au 4e Dragoons (Chambery).	The fauna of the French Soudan.

SILVER MEDALS (SMALL.)

M. Cozette, Noyon (Oise) and M. Lebrun, Percy (Manche).	The disinfection of railway trucks.
M. Delay, Chateaurnard (Bouchss du Rhone).	Ovariotomy in the bitch by a single incision.
MM. Guillmain and Cadix, 3e Chasseurs.	Notes on an outbreak of infectious pneumonia.
M. Huguier, Vétérinaire en 2e au 1er Chasseurs (Sousse, Tunis).	A clinical study of certain accidents caused by slipping in the horse.
M. Victor Lafargue, Vétérinaire en 2e au 3e Chasseurs d'Afrique (Setif).	Notes on botryomycosis.
M. Pecus, Vétérinaire en 2e, l'Ecole Militaire de St. Cyr.	Notes on two epizootics of pasteurellosa equina.
M. Pericaud, Montmorillon (Vienne).	Swine fever and infectious pneumo-enteritis.
Do. do.	Treatment of gangrenous coryza by saline injections (washing the blood).
M. E. Pierrot, Stenay (Meuse).	The surgical treatment of ventral and umbilical hernia.

HONOURABLE MENTION.

M. Maurice Pavor, Vendegies-au-Bois (Nord).	Complete torsion of the uterus, congestion and fatal hæmorrhage.

THE DESTRUCTION OF DISEASED CARCASES BY BURNING.

Drs. Lothes and Profé, of Cologne, contribute an important article on this subject to the *Berliner Thierärztliche Wochenschirft*, taking as their thesis the extreme desirability of destroying infective foci in diseased carcases if we are to succeed in our struggle against disease in living animals. The agents of disease remain in carcases or their surroundings virulent and ready to burst into life for a very considerable space of time, so that it only requires some small accidental circumstance to bring them into a new susceptible individual in whom they can unfold their pathogenic activity. The virus of rabies remain active in carcases for four to six weeks in spite of advanced decomposition. The bacilli of glanders remain virulent in damp media for three to four weeks. It is therefore to be assumed that they retain their pathogenic activity in the carcase for about the same time. Pieces of lung from tuberculous animals retain their capacity for infection for several months if kept in low temperatures. But by far the most resistant is the bacillus of anthrax. There is no doubt that there are formed anthrax spores in the carcase very shortly after death. These may originate, in cases for instance in which the carcase is not cut up, in the blood, which we nearly always observe in cases of anthrax oozing from the mouth, nose, and anus of the victim. Further, we may assume that the anthrax bacilli, which we find in the superficial blood-vessels of the skin, contain the supply of oxygen necessary for the formation of spores. The question whether the spores of a buried carcase can once more get into their baneful course is answered in the affirmative by constant experience. It has been proved that spores from buried carcases can be conveyed in various ways—as, for example, by underground currents of water—into activity after years and even decades of slumber, and may resume their noxious influence on some new individual.

Drs. Lothes and Profé proceed to give an account of some experiments made to test in this connection the porosity of sand and gravel surfaces by apparatus now so very largely used in practice. They took an iron tube about 6 feet long and 4 inches in diameter which was closed at its lower end with a thread net, into this they put gravel stones of walnut size till they filled up about 4 inches, then hazel-nut sized stones for other 4 inches, then the tube was gradually filled up with fine sand mixed with gravel the size of peas. Every now and then the contents of the tube were hammered in tight with a heavy stick. When the tube was filled up to within about 10 inches of the top it was hung perpendicularly on the wall, and a glass dish was placed beneath the lower end, then gradually about 3½ pints of ditch water was poured into the tube; after forty-eight hours some 1200 cubic centimetres (say 2 pints) of water had run into the glass vessel. Small quantities of this water were put into vessels and sprinkled over with agar, and then put into the culture cabinet; in from twenty-four to thirty-six hours numerous colonies were found, coli, proteus, cocci, but no anthrax colonies.

Drs. Lothes and Profé next took dry anthrax-pulp, which they obtained from the carcases of animals that had died of the disease, and which had been spread out for days, some of it for weeks, on object glasses, and this they sprinkled on the uppermost stratum of the sand and poured about 2½ pints of water over it. In thirty-six hours more than a pint had run into the glass vessel. This water was treated with agar as before, and in thirty-

six hours they had several anthrax colonies. A second experiment gave the same results, and likewise a third, in which sand sterilised by high temperature and distilled water were used; the anthrax colonies appeared with unfailing regularity. It seems, therefore, clear that anthrax spores pass with the help of water through strata 6 feet thick of sand and gravel in about thirty hours. As we know then that anthrax spores retain their virulence in the earth for many years, it follows that the burying of carcases so affected means the production of new foci of infection, which spread indefinitely. In Germany cremation establishments are very few and far between, the cost being very great,—indeed they are to be found only in the vicinity of large towns. It has been thought impossible to destroy carcases at an open fire, but Dr. Profé says that in 1900-1901 in the province of Posen he destroyed, with the approval of the owners, several anthrax-infected carcases in this way. The burning was effected in a comparatively short time and with wonderfully little expenditure of fuel if the carcase was placed on iron rails placed diagonally over the pit. He relates a case in point. A well-nourished cow had fallen a victim to the disease and the carcase was brought out into a pasture field, where a post-mortem was held by the veterinary surgeon of the place. As the transport of the carcase to the ordinary burial-place of the district was not possible with the means at hand, and as there seemed to be no other means of disposing of the carcase, it was resolved to try burning. For fuel peat briquettes were used, with petroleum to set them on fire. When the thing was fairly ablaze the farmer, a niggardly fellow, stopped the supply of fuel, but thanks to the amount of fat on the animal the burning was completed, but it took nearly forty hours to effect the destruction of the animal, which weighed some 11 cwt. The cost was about three shillings. Drs. Lothes and Profé resolved to try burning over an open fire at the municipal burying-place at Cologne. On the 15th July the skinned carcase of a horse was, with its entrails, weighing in all about 12 cwt., burnt over an open fire. This fire was lighted in a pit about 3 feet deep, and over it the carcase was placed on two iron rails about 6 feet long, lying diagonally. For fuel there was used 2 cwt. wood, 3 cwt. briquettes, and 50 lbs of coal tar. At the beginning ½ cwt. of wood and 1 cwt. briquettes were set on fire under the carcase, which was soaked in tar, and the rest of the fuel was used as required. The fire was lighted at six P.M., and on the following day at 2 P.M. there was only a small heap of smoking ashes. Smoke lasted only till the tar was consumed. The cost was 6s. 9d. Another case lasted twenty-six hours and cost about 9s. 6d. A third case—this time an ox—lasted only eight and a quarter hours and cost 6s. 9d. It was found that tar keeps up the flame better than resin and much better than petroleum. In these three cases the influence of the wind was found to be unfavourable whether it blew along or across the pit. It was therefore found to be desirable to make the pits deeper and lay the carcases further down, and this was arranged in the following way. A pit was made about 6 feet long, 6 feet broad, and 2½ feet deep, and then a further excavation was made of the same length and depth but only 36 inches broad, so that part of the "floor" of the upper excavation formed the borders of the lower, 18 inches on each side. On these borders the iron rails were placed diagonally, and on the rails the disembowelled carcase was laid, belly downwards. The fuel had, of course, been previously laid on the floor of the lower pit. The viscera were placed on the borders of the lower pit, whence, as the process

of cremation went on, they fell gradually into the glowing mass. A few cases may be cited in illustration of the process. A horse weighing about 16 cwt. was cremated with 6½ cwt. of wood; the operations took about ten hours and cost about 8s. Another horse weighing about 8½ cwt. was cremated with 4½ cwt. of wood and 30 lbs. tar; the operation took five and a half hours and cost 6s. 9d. An ox weighing 6 cwt. was cremated with 3 cwt. wood and 30 lbs. tar; the operation lasted three and a half hours and cost 5s. It is noted by the writers that town prices were charged for the wood; in the country it would be very much cheaper. They distinctly recommend the second method (the double pit) as requiring less fuel and occupying less time; besides, it is independent of the wind, and as the pits have often to be dug the day before the operation this is no small matter. They further recommend coal tar as preferable to petroleum, and advise that the carcase be smeared with it before burning. The place of cremation need not be very carefully chosen. Smoke is developed only at the beginning of the operation, and therefore little annoyance may be feared from this cause. The same may be said about the gases evolved in the process; no smell was perceptible 100 yards away, and this in the direction of the wind. Of course the cremation ought to take place on the spot where the post-mortem is held, and that must be at least 100 yards away from human habitation.

TUBERCULOUS INFECTION.

ARNOLD HELLER (*Münch. med. Woch.*, April 15th, 1902) attacks R. Koch's conclusions with regard to the etiology of tuberculosis. With regard to heredity, although he agrees that it is practically unimportant, he relates the story of an outbreak of tuberculosis among the guinea-pigs, which had come from a stock which were all rendered tuberculous. In spite of great care, many experiment and control animals died of tuberculosis. The exciting cause was discovered to be in some unsound hay, on which the guinea-pigs were fed. These animals had inherited the predisposition, at all events, to the disease. Next, he deals with infection through tuberculous meat and milk. Koch's statement rendered it necessary to report all data which could have any bearing on the subject. Koch considered primary intestinal tuberculosis in children very rare. Heller found in 714 necropsies, performed on children dead of diphtheria, that 19.6 per cent. showed tuberculous lesions. Of these 140 cases, 30.7 per cent. died of primary tuberculosis of the intestines, mesenteric glands, or both together, while a further 7.1 per cent. died of mesenteric gland tuberculosis accompanying tuberculosis of other organs. "It appears, therefore, on examining suitable material, that primary infection through the intestinal canal is common." Heller, lastly, recounts the case of a man, who attempted to obliterate the marks of tattooing by inoculating the scars with cow's milk. In the sight of these punctures lupus developed. On microscopical section, the nodules were found to contain numerous typical giant cells, but no tuberculous bacilli were found. He considers, then, that it is premature to relax the rules for avoiding the ingestion of milk, &c., from tuberculous cattle.

TRANSPLANTATION OF TUMOURS.

LOEB (*Journ. of Med. Research*, vol. viii., No. 1, p. 44) reports a further successful series of successful transplantation of tumours found in white rats into animals of the same species, especially a series of transplantations of the sarcomatous part of a mixed tumour. The growths were definitely ascertained to be real sarcomata and not granulomata. The sarcomata found in different rats showed some structural differences based on differences in the cells, on differences in the formation of fibres, and in the degenerative processes which take place; these differences were reproduced through about forty and eight generations respectively. After transplantation many of the peripheral cells of the fragment remain alive and mix with the growing connective tissue of the neighbourhood. It is very probable that these cells give rise to tumours after transplantation. In this series all attempts to produce tumours by transplantation into other animals —white mice, guinea-pigs, rabbits—have been without result. The injection of cystic fluid or of a fluid obtained by mincing the tumour with normal salt solution did not produce sarcomata; negative results, therefore, which were obtained with fluid filtered through different varieties of filters, cannot be regarded as indicating the character of the tumour-producing agency. Local metastasis and contact metastasis were also formed in this series of transplantations. A series of experiments were undertaken to determine how long pieces cut out from tumours could be kept on ice and yet develop sarcomata after transplantation. Pieces kept thus for one, two, and five days developed in each case several tumours, which proves that the tumour-producing agency is not destroyed or even markedly attenuated by the exposure. An adenoma of the mammary gland was also the subject of experiment. Pieces transplanted into the same animal remained alive, and underwent afterwards the same cycle of changes as that part of the original piece which was left during the operation; pieces transplanted into other rats became almost entirely necrotic.

MEMBERS IN NEW ZEALAND.

WHAT is probably the largest Conference of Veterinary Surgeons ever held in the Southern Hemisphere took place on August 27th and 28th last at Wellington, New Zealand, under the Presidency of the Chief of the Veterinary Division of the Department of Agriculture, Mr J. A. Gilruth, M.R.C.V.S. There were twenty-one members of the Royal College of Veterinary Surgeons present, also two other gentlemen holding Colonial degrees, the subjects discussed being departmental matters connected with the inspection under the Slaughtering and Inspection Act, the Stock Act, the Dairy Act, hereditary unsoundness in horses and the general work of the division, all of which gave rise to interesting discussions, and several valuable resolutions were passed.

After the Conference had broken up Mr. C. J. Reakes, M.R.C.V.S., Assistant Chief Veterinarian, presented Mr. Gilruth with a handsome gold watch, stating that a unanimous desire had been expressed by the members of the profession resident in the colony to convey to him in some practical manner their appreciation of the scientific value of his services to the colony and to the profession, and that this presentation it was desired

should be regarded not as emanating from the veterinary officers of a Government Department, but solely as from the members of the profession in New Zealand.

In reply Mr Gilruth said he was bound to say, in the first place, that it was quite out of order for the members of a department to make a presentation to their chief on such an occasion. He could not fail, however, to appreciate the good feeling which had prompted them to make him so handsome a gift, which he should always prize. He desired to thank them all for the assistance they had rendered him in the carrying out of the work of the department, of the investigations in which they had been engaged, and their cordial support on all occasions. He thanked them for their loyalty to himself, and trusted the good feeling which had existed among them would always continue.

In addition to being the chief of the Veterinary Division of the Department of Agriculture, Mr. Gilruth is Pathologist and Bacteriologist to the Department of Public Health, and to the New Zealand Branch of the British Medical Association. He was appointed Plague Commissioner during the outbreak of Bubonic Plague in New Zealand two years ago, and his work is very highly valued by the medical as well as the veterinary profession, his opinion being in constant request in pathological and bacteriological matters.

Extracts.

NOTES ON OBSTETRICAL MECHANICS.

BY M. BEDEL, OF DOYULE, CALVADOS, FRANCE.

1.—USE OF ASSISTANTS.

If assistants pull directly on the cords fastened to the fœtus they are likely to slip through their hands, and a great deal of power is lost. It is a good plan to tie them to a stick about 2 feet 6 inches long by 3 inches in diameter, two men can easily catch hold each side of the rope and pull together. If only two assistants are necessary or available it is advisable to cross the inner hands. If more than four are required a second stick can be used about 2 feet from the first.

If there are only two assistants available the cow should be thrown if not already done. The cross stick should be tied to the cord as close as possible to the calf. The assistants should sit on the ground facing the cow, with their feet firmly fixed against her thighs, pressing hard against them as they pull on the stick. In this way they exercise counter-extension against the mother, and their strength is exercised to the best mechanical advantage.

2.—DISMEMBERMENT OF THE ANTERIOR LIMBS.

Contrary to the directions given by Saint Cyr and Violet, "Traité d' obstétrique," who advise both limbs being brought into the passage, it will be found more convenient only to have the one to be operated on; the other should be replaced in the uterus after having first attached a cord, also the head, with one round the lower jaw.

Careful traction should be exercised on the limb, which will be easily

brought forward, and according to circumstances the skin divided on the inner aspect from the elbow to the knee or fetlock, a circular incision made, and the skin detached with the hand. The assistants then pull on the cords at the same time that the operator exercises counter-extension on the fœtus, by pressing with all his force against the sternum with the flat of his hand. The limb is usually detached without difficulty.

The second limb is removed in the same manner, if necessary, leaving the head in the uterus, which can be brought into position by the cord round the lower jaw and the fœtus delivered. This plan will be found preferable to Saint Cyr's, particularly with primiparæ, or where the passages are constricted, as there is more room to operate than when both limbs and the head are in the pelvis.

There is no fear of injury to the uterus from the retained parts as the traction is not violent; it is only after the skin has been completely removed that force is applied; and further, more danger is avoided by the counter-extension exerted by the hand of the operator.

It should be remembered carefully to secure the lower jaw and head before operating, otherwise it may slip down and be difficult or impossible to recover.

3.—THE USE OF CORDS IN DISMEMBERMENT OF THE FORE LIMBS.

In uncomplicated cases the cords are usually put round the fetlocks, but they may slip over the hoof and tear off the toes. It is better to use a loop of webbing, one end of which can be slipped through the other, and the cord passed through the free end. Flat lamp wick does well for this purpose. If the fetlock joint is likely to be torn off, it is advisable to pass a second cord above the knee, and if it threatens to disarticulate or the radius to fracture, a third may be put over the elbow.

5.—THE CORACO RADIALIS OR FLEXOR BRACHII IN THE CALF.

In the calf this muscle offers most resistance to removal of the limb. When the cords are fastened above the knee most of the force is transmitted to the shoulder indirectly through the scapulo-humeralis and humero-radialis, but directly by means of the coraco radialis, which arises from the coracoid process, by its superior tendon, and is inserted below into the internal and superior tuberosity of the radius and the capsular ligament of the elbow joint. If the muscle is divided a little above its lower insertion and traction applied, the limb will be easily detached at the shoulder joint. M. Bedel narrates a case:—"I was called to a cow that had been paining since the day before. The os was dilated, but in front there was a diagonal fold of the uterus from above downwards, and right to left. After this had been adjusted by the hand the calf could be touched very deep down. The two fore limbs were corded and traction applied, the hind and fore legs entering the pelvis, where they became completely fixed by the elbows becoming arrested by the fold of the uterus.

"As I was afraid of rupturing the uterus I decided to remove the fore limbs. The head and left fore leg being returned, the right was brought forward, the skin removed in the usual manner, and traction applied.

"There were only two assistants, but they were strong intelligent men; but although considerable force was employed, they were unable to move the fœtus, and on examination I found the coraco radialis muscle very tense

and extended. This was divided a little above the point of insertion, and on traction being reapplied came away at once at the shoulder joint."

From this it would seem that in certain cases it is advantageous to divide this muscle.

5.—POSITION IN WHICH TO PLACE THE MOTHER.

In many cases this is of no importance, but in breech presentations it is almost impossible to adjust the hind limbs if she is down.

If the head is turned round to a considerable degree so as to be under the sternum the ear only can be caught hold of. If the cow is down the pressure of the ground on the abdomen will often raise the calf's head sufficiently to allow the lower jaw to be grasped and secured.

(*Recueil de Médecine Vétérinaire*, 30th October 1902.)

PULMONARY FILARIA (*F. IRRITANS* OF RIVOLTA) AND SUMMER SORES IN THE HORSE.

COMMUNICATED TO THE SOCIÉTÉ CENTRALE DE MÉDECINE VÉTÉRINARE, PARIS, NOV. 13TH, 1902, BY M. DROUIN.

ON the 9th of last October I was informed that the veterinary inspector at the abattoir of Ville Juif had seized the carcase of horse No. 79,019, belonging to the General Carriage Company, as being affected with "pulmonary glanders."

On the morning of the 10th I proceeded to the abattoir, where the lungs were produced for my inspection. They were absolutely riddled with small nodules that at first sight appeared identical with those of glanders. The classical symptom "of grains of shot" in the parenchyma of the lung was conveyed to the hand when passed over the pleura, but it was noticed that several of the nodules while retaining their round form were the size of a small hazel-nut, which those of chronic glanders seldom are.

On incising one of the largest nodules it was at once seen not to be glanders. It contained a fibrous shell about 2 to 3 mm. thick, that in no part was calcareous. It contained a core of fibro-caseous matter that was *not* adherent to the wall, and which easily could be pressed out of the shell by the finger. The core was of a yellowish-white colour, faintly mottled on the exterior, and when handled somewhat elastic. Under pressure they were easily reduced to a pulp.

These lesions were exactly those described by M. Nocard, and which he has demonstrated to be due to the same cause as "summer sores,"[1] and I remembered that the animal in question had suffered from them on the haunch and loins. There was now no doubt that the case was one of pulmonary filaria, and not glanders, and in this opinion I was confirmed by M. Nocard.

I hand round a specimen of the lung, in which you will notice nodules of all sizes up to that of a nut. The newest have the borders somewhat diffused, and of a gelatinous consistency. They already enclose a small

[1] Bulletin de la Société Centrale de Méd. Vét., 1901, page 387.

fibro-caseous core. In a more advanced stage, when the nodule is about 2 mm. in diameter, a thin membrane perfectly smooth on its internal surface forms, from which on gentle pressure a small rounded body of a whitish-yellow colour, mottled on the outside, escapes.

In the last stage of development the central mass, "which always remains free," is surrounded by a thick fibrous shell, which, along with the contents, never shows any tendency to calcify.

The contents of three of the largest nodules were beaten up in sterilised water and injected into the peritoneum of two male guinea-pigs, which are still alive and well, without the slightest trace of orchitis.

A histological examination has been made by M. Vallée. Most of the nodules presented no trace of the parasite, but in some it was clearly seen in a spiral form, and the skin streaked transversely, as described by M. Laulanie in 1884 in the Granulations of Summer Sores.

The horse was treated on July 19th, 1902, for these sores, which increased to a considerable size, and as the animal was a bad patient there was difficulty in treating him. Continual irrigation was used to allay the intolerable itching, and after three months the wound assumed a healthy appearance, but as the patient was of small value it was decided to destroy him. During the past year we have had three horses seized as being glandered at the abattoir, where they had been sent for "summer sores," all of which had been previously treated with mallein with negative results.

It appears advisable that the attention of all inspectors should be invited to the generalisation of the "summer sores" which Rivolta in 1868 and Laulanie in 1884 attribute to a parasite that M. Railliet has termed *Filaria irritans.*

(*Bulletin de la Société Centrale de Médecine Vétérinaire*, 30th Nov. 1902.)

Note.—Summer sores, estival sores, or granular dermatitis are well known in France, Italy, and the south of Europe in the hot months of the year, but have not yet been reported in England. The question arises whether some of the puzzling cases of glanders in military animals in South Africa in which nodules were found in the camp, although during life mallein gave no reaction, were not due to *F. irritans*, especially when it is remembered that a large number came from semi-tropical countries, such as the southern United States, and which were all treated with mallein previous to embarkation. A description of the disease will be found in Neumann's *Parasites and Parasitic Diseases of Domesticated Animals*, page 257. J. A. N.

PARALYSIS OF THE PHARYNX IN A HORSE.

BY PROFESSOR F. HENDRICKX.

PARALYSIS of the pharynx, if one is to judge from observations recorded in veterinary publications, would seem to constitute a rare enough condition. The symptoms which reveal it are, however, far from being the same in different cases. Certain accounts seem to point to it as an affection of a paralytic nature involving at the same time the muscles of the pharynx and also those of the larynx; in other cases, on the contrary (and these latter appear to constitute the majority), the paralytic phenomena are limited to

the pharynx. In certain cases, this state appears to have been preceded by an inflammatory condition of the pharyngeal mucous membrane, whilst in others the malady begins in an abrupt manner, and in animals which up to that time had not been seriously indisposed.

The following observation, which we have been able to follow from commencement until death, appears sufficiently interesting to merit accurate recording. Towards the end of October 1901 there was submitted for our examination a cart-horse colt, aged about two years, which two days before had suddenly stopped eating during a meal, had emitted coughing sounds, and had at the same time ejected by the nostrils some of the food already swallowed. At the time of our examination, the colt showed a slight swelling of the sub-glossar ganglia and a bilateral salivary discharge. Mastication was perfect, but at the instant when the bolus ought to have passed into the œsophagus, the animal made a slight movement of the head, while a quantity of well-masticated food was discharged through the nostrils.

These symptoms pointed directly enough to pharyngeal spasm, but the pulse was normal and the rectal temperature little raised (38·7°); on the other hand, pressure over the parotid region provoked no resistance in the animal. These three signs showed that there could hardly be inflammation of the pharyngeal mucous membrane, and we were thus brought to the conclusion that the trouble lay in the œsophagus. We could not, however, detect any foreign body, any œsophageal folding, any stenosis, or even that it was a case of spasm of the œsophagus; a careful investigation decided us that there was nothing of the kind, and, indeed, the animal appeared quiet and showed none of that anxiety which always denotes the presence of a foreign body. Examination of the whole neck and œsophagus revealed no abnormality.

If, then, an obstacle was present in the tube, such as a fold or a stenosis, it must, we inferred, be in the intrathoracic portion. In order to proceed as systematically as possible, I made the colt lie down, and then passed an œsophageal sound which reached the stomach easily, a fact of which we were convinced by the acid smell of the alimentary *débris* adhering to the end of the instrument.

We could thus dispose of the idea of any obstruction in the course of the œsophagus. As for spasm of the œsophagus, it was out of the question, for during the emission of matter, which had undergone the process of deglutition, through the nostrils, the colt remained perfectly still; and we could never observe the violent contraction of the inferior cervical muscles which is rarely absent in this affection, and which accompanies equally nausea and vomiting in the horse.

Having determined that the alimentary discharge supervened after the first bolus had been swallowed, and, on the other hand, not perceiving the contractions of the œsophagus in the jugular furrow, we asked ourselves if there might not be present a painful wound or cicatrix at the beginning of the canal. We therefore tried direct exploration by means of the fingers, and, lifting up the uvula, passed our index finger into the pharyngeal cavity as far as the larynx and into the œsophageal orifice, but found nothing abnormal.

Thus, having disposed successively of all the affections possible as far as the œsophagus was concerned, we were brought to the conclusion that there must be a paralysis of the pharynx, without being able in the mean-

time to determine the cause of the affection. Prognosis would also have to be reserved until we awaited the effect of revulsive treatment externally and of tonic and antiseptic treatment internally, which were now begun. At the end of a few days the difficulty in swallowing had increased to such a degree that so little food was ingested that emaciation had gone on to a great extent.

It is worthy of note that at no time in the course of the affection could we observe the particular symptom insisted by Dejure and Hamoir, namely, that dysphagia is greater in the case of liquids than in that of solids; for with this colt it had become so pronounced that we observed grave dyspnœic symptoms supervene whilst the animal was feeding, on account of the nasal cavities becoming filled with alimentary *débris* of pharyngeal origin. At certain times there was such danger of asphyxia that we should have been driven to perform tracheotomy had it not been possible to rapidly clear the nasal cavities.

Soon, however, the respiration became quickened even during meals, and the temperature rose to 40·2°, while auscultation of the breast showed numerous sounds indicating moisture on both sides, and the breath had a fœtid odour, this pointing to the fact that the animal had contracted a gangrenous broncho-pneumonia due to the passage of particles of food into the bronchi; this complication obviated the death of the animal *by hunger*, for, before that could take place, the pulmonary lesions had happily put an end to its sufferings.

The autopsy which took place immediately revealed the following facts:—The nasal cavities were filled with regurgitated alimentary matter; the nasal mucous membrane was greatly inflamed and bluish, and at a great number of points we noticed holes in its substance, a kind of mucous ulceration caused by the friction of the hard and fibrous alimentary *débris*.

The pharynx showed nothing abnormal, apart from two slight erosions due probably to food; the pharyngeal muscles showed no particular lesion, and, on making an incision, colour as well as consistency were found to be normal, but the retro-pharyngeal glands were swollen, and on the right side there was seen a purulent focus about the size of a pigeon's egg, originating probably as a slight infection from the superficial lesions in the pharynx.

The œsophagus on being dissected carefully in its whole length showed not the slightest anatomical injury either in the mucous or muscular coats; the mucous membrane of the larynx and of the trachea was slightly inflamed; in the lungs there were numerous foci of broncho-pneumonia scattered in the lobes, and these had in most cases already become gangrenous; in following out the bronchi as far as possible we came upon particles of bran and straw.

In presence of an autopsy which explained none of the dysphagic symptoms observed during life, one could but come to the conclusion that there must have been some paralysis of the muscles of the pharynx without being able to explain the condition. Might it not have had for its origin an infective focus of a stranglous nature in the central nervous system?

A complete examination of this system would have set such doubts at rest, but to our great regret, on account of circumstances over which we had no control, such an examination never took place.

(*Annales de Médecine Vétérinaire*, Nov. 1902.)

SEPTICÆMIA CAUSED BY LARVÆ OF GASTROPHILUS EQUI IN THE ŒSOPHAGUS.

A FOUR-YEAR old mare was attacked with colic. She scraped with her fore-feet, lay down every now and then on her back, drew her legs in towards her body, but neither turned her head round to look at her belly nor struck with her hind-legs against it. Her pulse was very rapid, and finally vomiting set in. Appetite failed entirely. After the lapse of thirty-six hours she died. The post-mortem showed, along with bright, red colouring of the serosa of the small intestine, fatty degeneration of the liver, kidneys, and spleen, parenchymatous inflammation of the cardiac muscles, hemorrhage under the endocardium, the serosa of the abdominal and thoracic cavities, the serosa of the large intestine and the mesentery, hæmorrhagic inflammation of the mucosa of the large intestine, which was filled with semi-fluid contents. In addition there was found a dark red spot on the œsophagus a finger's-breadth above the cardia. At the point corresponding to this spot the inner surface of the œsophagus was much thickened and inflamed, and furnished with numerous deep crypts. In these the larvæ of the gastrophilus equi had taken up their abode in great numbers. The mucosa and muscularis had become involved and degenerate. In the stomach, apart from slight inflammation in the cardia, nothing abnormal was to be noticed. Its contents consisted of semi-fluid masses, and it contained only a few larvæ. The animal had therefore died of septicæmia and peritonitis. The origin of these is to be found in the great aggregation of the larvæ in the œsophagus, for between the masses of larvæ the fodder remained sticking in the narrowed œsophagus, and became putrid as the softening influence of the gastric juice was wanting. The wounds that had arisen by the setting free of the larvæ became infected, the inflammation spread to the sphincter cardiæ, and this becoming weakened made the vomiting possible.

(*Tijdschrift voor Veeartsenijkunde.*)

[The Editor remembers of a case of purpura hæmorhagica in which death occurred from hæmorrhage into the stomach, due to the weakening and irritation of its walls by numerous larvæ or bots.]

CYSTICERCUS IN THE LIVER AND PERITONEUM IN LAMBS.

CLINICAL LECTURE GIVEN BY M. G. MOUSSU, ALFORT VETERINARY COLLEGE, ON MARCH 5TH, 1902.

GENTLEMEN,—I need hardly remind you how inattention to or neglect of the ordinary rules of hygiene is prejudical to the rearing and fattening of farm-yard stock.

Lesions.—I bring to your notice to-day the post-mortem of a two months' old lamb, and in one of the specimens, "the liver," you will see what appear to be a number of small abscesses scattered over its surface under Glisson's capsule, and covered with firmly adherent yellow-coloured false membranes. If these membranes are carefully removed, it will be seen that these are not

abscesses, but small elongated, bent vesicles, varying in size from that of a grain of barley to a small bean. They are easily removed from the substance of the liver, and are not all of the same size, which proves that their age varies.

On the surface of the organ in the vicinity of the vesicles you will notice long sinuous streaks, "apparently hæmorrhagic," arising from the liver tissue and terminating in the vesicle. These streaks are the tracks left by the embryos before they become fixed at the point where they develop into cysts. They are about the size of a probe, and are larger and more clearly marked when the cysts are young.

There is also present a certain degree of exudative peritonitis and inflammation of the mesentery and epiploon, in all three of which you will notice that there are a certain number of vesicles, and although this subject is not badly affected, "there not being above thirty cysts," it is easy to understand the evolution of the complaint, and explain the mortality that takes place in flocks that are attacked.

Etiology.—None of the lambs appeared to be unwell before the age of four to six weeks, and those in question were not yet weaned, but were commencing to feed with the ewes, and also drank a small quantity of water, or they had not been out of the fold.

There is no doubt that the cysts are the *Cysticercus tenuicollis* in process of development, and if the lambs had lived a little later, they would have been recognised as measles, "Boules d'eau," but only those in the peritoneum would have come to maturity, those of the liver would have atrophied.

The following is the life history.—The farm dogs become infected with tape-worm, no doubt *Tænia marginata*. The segments and eggs are passed, and by the rain, &c. worked into the drinking water, by which means the lambs are infected, although they have never been on the pasturage.

The embryos perforate the walls of the intestine, get into the aphthents of the portal vein, and desseminated over the liver through the substance of which they migrate till they reach the locality where we see them now. It is also possible that some may have reached the lungs through the lacteus, or one has been found in the middle of an inflammatory patch.

Two questions now are—

1. Why are not the ewes affected? It is a well-known fact that adults escape parasitic infection when young subjects are attacked, as is illustrated by *Cœnurus cerebralis echinococcus*, and in this case cysticercosis, and if attacked they do not show such severe symptoms, or any at all, the mature organism being more resisting.
2. Why has the mortality in this case been so high, when cysts are often found in the carcases of fat sheep in large numbers after they have been dressed, although no manifestations were shown during life?

No doubt the number of parasites is not sufficient to cause death, but I must remind you of the presence in this subject of peritonitis, interstitial hepatitis, and the patch of broncho pneumonia. The embryos during their migrations are admirable conveyers of pathogenic organisms that cause septicæmia, peritonitis, and hepatitis, and it is to such secondary lesions in cases like the one under notice that death is due.

If the number of embryos is small and the organisms brought with them

not active, the patient is able to resist them, and when they (the parasites) become stationary there is no further danger. The host is not inconvenienced, fattens, and makes a good carcase.

Symptoms.—The symptoms of peritoneal cysticercosis are very vague, and there is nothing in the external appearance of the patient that will enable us to arrive at a positive diagnosis, and it is only by a post-mortem examination that the true state of affairs can be discovered.

The lambs are dull, weak, and take no notice of surrounding objects. The appetite is lost, but there is considerable thirst; the temperature remains at about 104° F. They rapidly fall off in condition, and severe fœtid diarrhœa sets in during the latter stages.

Prognosis.—The prognosis is bad, but it is uncertain, as it entirely depends on the degree that the animal is infected, and if in a flock several deaths take place, in all probability the majority are affected, but of course in a variable degree, but the only means of telling to what extent is the falling off in condition and increased weakness.

Treatment.—There is no curative treatment and no therapeutic agent known capable of acting on the parasites during the process of evolution. We can only trust to nature and the power of resistence of the patient.

Prophylactic measures are our stand-by, and they can be used in the case of other parasitic affections, such as *Cœnurus cerebralis echinococcus*, &c., and consist of periodically treating *all* the dogs on the establishment for tape-worm, and carefully destroying them when expelled in the fæces. The administration two or three times a year of 2 to 4 grammes of powdered areca nut, or 4 to 8 grammes of ethereal extract of male fern, followed by a purgative, is sufficient, and of course the dog should be kept locked up in the meanwhile.

If flock-masters studied their own interests, and were aware of the life-history of the parasites that at times decimate lambs, they would adopt this simple and inexpensive remedy.

(*Recueil de Médecine Vétérinaire*, 15th Nov. 1902.)

TRANSMISSION OF BOVINE TUBERCULOSIS TO THE HUMAN SUBJECT BY ACCIDENTAL INOCULATION.

THE following case is interesting in view of Professor Koch's declaration. A man, sixty-three years of age, presented himself on 3rd February 1902 at the Surgical Clinique at Utrecht, suffering from an affection of the little finger of the right hand. He had in May 1900 skinned a cow which had been condemned as suffering from generalised tuberculosis. During the autopsy the veterinary surgeon had unfortunately wounded the skinner in the little finger with the knife which he was using. Three days later the trifling wound had healed, but the finger remained painful and afterwards there gradually developed a swelling, with cracks.

On examination it was found that the skin of the little finger was thickened and of a bluish colour on the dorsal and lateral regions, especially at the articulation of the first and second phalanges. In the centre of the thickened part there was noticed a pretty deep crack covered with small

crusts. The affection was localised in the skin, which was painful on pressure. The movements of the articulations of the little finger were normal, except flexion in the articulation of the first and second phalanges, which was limited. There was clearly cutaneous tuberculosis, probably caused by accidental inoculation of bovine tuberculosis. The corresponding cubital gland was swollen, and of the volume of a pea. Otherwise the man was healthy enough. At the age of ten he had suffered from inflammation of the left knee, probably of traumatic nature; as a consequence of the affection the articulation had lost its mobility, and on the sides of the joint broad cicatrices were found. Sixteen years ago the patient suffered from pleurisy. For a year past he had had a cough, but very little expectoration (let it be kept in mind that the wound on the little finger dated back twenty months). At the apex of the right lung there was noticed, at the back, a slight dulness and a sound as of moisture, but in the sputa there was no trace of the bacilli of tuberculosis. During his stay in hospital (3rd to 15th February) the temperature of the patient remained constantly normal. On 7th February Professor Narath extirpated with a bistoury the diseased part of the skin of the little finger, as well as the tumefied cubital gland. Eight days later the patient left the hospital.

The tuberculous nature of the cutaneous lesion of the finger, as well as the hypertrophy of the cubital gland, was easily made manifest, both by inoculation into the guinea-pig and by microscopic examination. As the skin was probably impure, three guinea-pigs received on 7th February each a small morsel under the skin of the inner side of the thigh. Two of these animals died of tetanus five and six days respectively after the inoculation; in the third there was observed swelling of the inguinal and crural glands on the inoculated side, and a small abscess soon opened at the point of inoculation, showing the well-known ulcerous sore. The weight of the animal diminished gradually, and death supervened on 18th April, seventy days after inoculation. At the post-mortem typical generalised tuberculosis was found to be present—confluent tuberculous nodules, especially in the spleen, liver, and lungs. As it was possible that the organs of this animal were impure, it was decided not to go on at once with the inoculation of the calf, but to make a second passage through the guinea-pig. On this same day, therefore (18th April), a small quantity of the pulp of the spleen of the dead guinea-pig was injected into the peritoneum of two guinea-pigs; these animals were likewise attacked with tuberculosis, one died on 13th May, and the other was killed two days later. The tuberculous spleen of the latter was used for experimenting on the calf to be mentioned presently, as also for making cultures.

With the fragment of the cubital gland of the human patient the same course was pursued as with the skin of the little finger. Two guinea-pigs inoculated subcutaneously on 7th February presented the same symptoms as the guinea-pig which became tuberculous after inoculation with a fragment of skin, and died a little earlier than it (the one 58 the other 61 days after inoculation). At its autopsy there was also found generalised tuberculosis.

A microscopic examination was made of the sections of tuberculous lungs of the guinea-pigs infected either with the skin or the cubital gland of the human subject. In the tubercules and the numerous foci of tuberculous pneumonia found there the bacilli of tuberculosis were very abundant. The lesion of the little finger and that of the cubital gland of the

man were thus undoubtedly of a tuberculous nature. Besides, there were found on microscopic examination of the sections of the skin and of the gland the anatomical lesions of tuberculosis—in the skin tubercles and gland cells; in the gland, in addition to these, calcification. But tuberculous bacilli were rare, as well in the skin as in the gland, and this contrasted surprisingly with the great number of these bacilli in the lungs of the inoculated guinea-pigs.

Microscopic examination having shown that the spleen of the guinea-pig killed on the 15th May contained numerous bacilli, that organ was triturated in a sterilised mortar, with 15 cubic centimetres of physiological saline solution, also sterilised, and with this cloudy emulsion a calf was inoculated. The animal, a female aged thirteen months, and weighing 109 kilogrammes, had for five days previously occupied a newly built cow-house in the Utrecht abattoir, in which no other animal had up to that time lived; further, it had been proved free of tuberculosis by a preliminary injection of tuberculin. The only food it received was hay and cake—no milk. Into this animal there was injected on 15th May 2 cubic centimetres of the emulsion of the spleen of the guinea-pig as above mentioned, under the skin of the right side of the neck. Five days later there was a distinct swelling at the point of inoculation. Appetite remained good. The second day after this the cervical gland was visibly tumefied. On the 26th the swelling at the point of inoculation had acquired the volume of a man's fist, and was hard and painful; the cervical gland of the same side was almost as big, and it also was hard and painful. On the 2nd June the swelling was not quite so hard. The animal coughed from time to time, and was frequently found lying down; it drank more frequently than before. On the 14th it was observed that the swelling of the right cervical had further increased, and there was a little diarrhœa. Twelve days later fluctuation appeared at the point of inoculation; the animal still coughed, but the diarrhœa had ceased. On the 2nd July the hair of the most protuberant part of the swelling began to fall; on the 11th there was still no ulceration at this point. The animal was slaughtered the following day. At the autopsy there was found at the point of inoculation on the right side of the neck a tuberculous granuloma of the size of a man's fist, in the centre of which there was a great cavity filled with a softened caseous mass. The right superficial cervical gland, situated at a distance of 10 centimetres from the granuloma, was hypertrophied and hard; it was 12 cent. long, 6 broad, 7 thick, and weighed 345 grammes. Calcification was observed at several points of the section; the cortical substance, easily recognised, had a thickness of 4 centimetres, was greyish in colour, and sprinkled with caseous foci. The medullary substance, less swollen, showed the same deterioration. There was no liquid exudate in the serous cavities. The visceral pleura presented numerous tubercles, the diameter of which varied from 1 to 6 millimetres. The small tubercles (of the volume of a millet seed) were transparent, greyish-pink, and homogeneous. In the larger tubercles likewise greyish and more or less transparent, small yellowish, opaque blotches could be distinguished. The largest tubercles were flattened and inclined to stand out; some were in high relief. The tissue of the lungs was also the seat of tubercles of the same age, with an inflammatory aureola in their periphery. There were no foci of caseous pneumonia. The anterior and posterior bronchial and mediastinal glands were hypertrophied, and on section were found to be crammed with caseous non-calcified

tubercles. On the parietal pleura only a single tubercle was found, with a diameter of 3 millimetres, at the level of the sixth right rib. The liver and spleen showed a small number of tubercles irregularly scattered in the capsule and parenchyma. One or two tubercles were found here and there in the kidneys. The tubercles of the liver, spleen, and kidneys were of the same age as those of the pleura and the lungs. The peritoneum, intestine, and mesenteric glands, the inguinal glands, and the left superficial cervical gland were free from tuberculosis, at least to the naked eye. On micro scopical examination it was observed that the tuberculous foci contained a great number of giant cells and numerous Koch bacilli. Finally, two guinea-pigs, inoculated with matter from the hypertrophied cervical gland, both died tuberculous.

These observations show that the bacillus of bovine tuberculosis does not quickly lose its virulence for the bovine species by its sojourn in the human organism. In fact, although the bacillus had lived twenty months in the skin of the human patient its virulence for the calf was not less powerful than that of bacilli coming direct from the bovine species. In the opinion of the writers the bacilli of human tuberculosis and of bovine are only different families belonging to the same species. They admit that the bacillus of human tuberculosis may acquire the properties of the bacillus of bovine tuberculosis by passage through bovine animals, and that, conversely, the bacillus of bovine tuberculosis may, by passage through man, become identical with the bacillus of human tuberculosis.

(*La Semaine Médicale.*)

TWO CASES OF CONSUMPTION PROBABLY INFECTED BY TUBERCULOUS MILK.

In the course of my investigation of cases of consumption in connection with the voluntary notification of phthisis in Manchester, the following history has been recorded, which strongly points to infection by means of tuberculous milk.

The patient, E. S., male, aged seventeen, was visited on November 1st, 1902. The illness commenced in December 1901, with loss of appetite, especially in the morning. He had no cough then, but began to lose flesh very slightly. This continued up to the third week in May 1902, when an ischio-rectal abscess developed, which was opened. After this the patient began to lose flesh rapidly, and has continued to do so up to the present. The abscess discharged for about three months and left a fistula, which was operated on about seven weeks before the date of my visit. One week after the operation, as the patient was drinking a large quantity of liquids, diabetes was suspected, the urine was examined, and found to be loaded with sugar. He had been drinking a large amount of water at his work for some weeks previously, but this had not been observed at home, so that the diabetes had certainly not been present for more than three months. There was no cough before the operation on the fistula; the patient and his mother are both certain on this point. After the operation, cough developed rapidly, and the sputum now contains tubercle bacilli. There is no family history of consumption, with the exception that the patient's sister, aged five years, died of tuberculosis on July 2nd, 1901. This child

was removed from home to another address on April 18th, 1901, where she remained until her decease, and where E. S. also stayed for about two months at the same time. For some weeks before her removal the girl had suffered from loss of appetite and some vague symptoms of discomfort in the abdomen, but she had no cough then; in fact, she never developed a cough. On May 26th she complained of epigastric pain, and vomited. The abdomen was hard and tender, the tongue furred, and the pulse small and quick. Appendicitis was diagnosed, and an abscess ultimately formed, which began to discharge through the umbilicus. On June 26th, 1901, an operation was performed and an abscess evacuated. After the operation, from the condition then found, the conclusion was come to that the disease was tuberculosis, and the mother was informed of this fact at the time.

Neither of these two patients drank much milk, probably not more than 3 oz. each daily; but the milk supplied to this family has been almost continuously tuberculous for over two years, and at one period especially (March 1901) was very markedly so. Specimens of the milk which the family was using were taken on September 5th, 1900, and found by Professor Delépine to cause tuberculosis in the guinea-pig; from a fresh milk supply on March 4th, 1901 (two cows with tuberculous udders found by Mr. Lloyd, veterinary surgeon to the Manchester Corporation), and again from the first milk supply on January 18th, 1902 (one cow with tuberculous udder found by Mr. Brittlebank, M.R.C.V.S., veterinary surgeon to the Manchester Corporation). When the address of the two patients was changed in the end of April 1901 the new milk supply was again tuberculous, for on July 11th, 1901, the farm from which the milk was obtained was visited by Mr. Brittlebank and a well-marked case of tuberculosis of the udder found. The milk from this cow was also found by Professor Delépine to cause tuberculosis in the guinea-pig. The cow in question was slaughtered, and the udder submitted to examination by Professor Delépine, who reported the lesions in the udder to be most extensive, the mucous membrane of the acini being very markedly tuberculous. In the opinion of Mr. Brittlebank the udder must have been affected with tuberculosis for at least three or four months.

The disease in both these cases began in the abdomen, and in the case of the girl never reached the lungs, while in the case of the boy the lungs were only affected secondarily. No source of infection apart from milk could be ascertained in either case.

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ON THE SURGICAL TREATMENT OF OLD CICATRICES CAUSED BY SADDLE GALLS.

BY M. A. QUERZVAU, V.S., 7TH CHASSEURS, FRENCH ARMY.

THE method I am about to describe for the radical treatment of old cicatrices resulting from saddle injuries is a modification of the autoplastic one for old broken knees, introduced some years ago by M. Vinsot, of Chartres.

In studying wounds of the knee we cannot help being struck with the

fact that in many cases there is adherence between the skin and deeper structures by cicatricial tissue that interferes with the motion of the joint, and causes the well-known stumbling of badly broken-kneed horses.

In the cases I have performed the autoplastic operation for broken knee on I have noticed that the normal degree of flexion of the joint has been noticed after the adhesions have been got rid of and the stumbling and tripping cured. Later on, in dissecting old saddle injuries, I found the same cicatricial adhesions as in broken knees giving rise to the same consequences, and I came to the conclusion that they also would be amenable to an autoplastic operation, and the result has justified my expectations.

Vinsot's operation consists in removing from the front of the knee an elliptical shaped portion of skin embracing the cicatrix with the help of the Travial Bascule, known by his name, which he is the inventor of, and which is indispensable. The flap is removed under strict antiseptic precautions, the edges brought into apposition with interrupted sutures, and the limb put up in a special bandage. Union takes place in about fifteen days, and the hair hides the thin linear cicatrix left.

When the operation was first brought out it was only intended to increase the value of valuable animals that were blemished by broken knees, but it has been since found that by removing the adhesions and restoring the joint to its normal degree of flexion that animals are rendered as sure-footed as they were before the accident.

The knee joint being a true tissue, it is necessary that the skin should have absolutely free play over it. If a mark is made on the skin of a perfectly sound knee when the horse is standing and then the joint flexed, it will be found that the mark is at least 2 or 3 cm. near the fetlock, and it will be realised how greatly any adherence will interfere with the motion of the part.

I have often noticed how many broken-kneed horses are sent out of the army for stumbling and being unsafe to ride, for which no cause can be found, being to all appearance perfectly sound in their limbs. Such cases are, I am convinced, entirely due to adhesions, and I have proved that the autoplastic operation will effect a radical cure.

These remarks apply to old saddle injuries, the conditions being alike, the skin being bound down and motion interfered with, the result in one case being stumbling and tripping, and in the other a fresh injury every time he is ridden.

Vinsot's operation has not yet been introduced to any extent in military practice, as special apparatus is required, but I have frequently removed small tumours with the oval incision described by him with good results, and the opinion I have arrived at is that the operation on the back is much easier than that on the knee to perform.

The injuries indicating operation can be divided into three classes, according to the way in which the cicatrix has formed.

1. Those in which the tissue is indurated, devoid of pigment. 1 to 2 cm. in size, and still painful some time after the wound has healed up, the cicatrix being slightly elevated above the surrounding skin. These injuries at first sight would appear to be unimportant, but each time the horse is ridden they become painful and œdematous, and require several weeks' treatment before the fluid is reabsorbed.

Such cicatrices are the result of an abscess in the back. The skin is almost normal, especially if it has been only destroyed over a small surface,

but it is united by firm fibrous adhesions to the panniculus, or sometimes even the deeper-seated muscles.

Being thus bound down the skin is unable to move and "give and take" to the motion of the saddle, and after a short space of time the result is a certain amount of straining at the deep part of the cicatrix, with possibly rupture of the adhesions or fibres of the panniculus, and persistent and very painful œdema. Injuries of this nature are nearly incurable, but if operated on the animal can be worked without fear of recurrence in about two months.

2. The skin preserves its normal characteristics and a certain degree of mobility, but underneath it there is a small tumour uniting it to the deeper seated tissues. The tumour, which may or may not be fibroid, is formed out of the walls of an old cyst, from which the fluid has been absorbed. Although the skin is not altered, such injuries give rise to the formation of new cysts after the horse has been used a few times, and treatment by blistering is not satisfactory. When operated upon I have found that the animal is fit to work in about a month.

3. There are numerous flat cicatrices destitute of hair in which the skin preserves its mobility, but the epidermis is thin and weak. These cicatrices are small individually, but several exist on the back, and are usually devoid of pigment. They are the result of gangrene of the superficial layers of the dermis, which is destroyed down to the level of the hair bulbs. When the wound heals up a new dermis and epidermis is formed which is deficient in elasticity and unable to resist the friction of the saddle, and horses suffering from them are always liable to gall.

It may be said that these are extraordinary and rare cases, but I will venture to say that in any cavalry regiment a score of such can be found which are incapable of carrying a man eighty miles in three days without being injured and laid up for several weeks.

The operation should only be performed in old standing cases in which the cicatrix has perfectly formed, and in which there is no suppurating wound or œdema, as if there is, the sutures will tear out and complicate the results. Also the horse should not be ridden for some days previously.

The best time of year to operate is September and October or March and April, just before the change of the coat, as the new one will cover the parts fifteen days to a month afterwards. If the operation has to be performed during the great heat of the summer when there are flies and insects about, the patients should be kept in a dark box with blinds or shutters to the windows. The animal is thrown in the usual manner, if possible in a place sheltered from the wind being selected, so as to avoid dust being blown on the wound and contaminating it, and an anæsthetic given. This is essential, "although it need not be complete," in order to prevent tearing out of the sutures by muscular contraction.

The instruments required are two razors, two very sharp bistouries, two premier forceps, two Vensol's needles, and two pairs of scissors. These, previously disinfected, I place in a 3 per cent. solution of carbolic acid. Sutures, antiseptic gauze, boiled water, napkins, and absorbent wool are also required.

The piece of skin removed is usually in the form of an ellipse, circumscribing the cicatrix, from 15 to 30 cm. long, by 2 to 5 cm. broad, the latter being the maximum, or there will be great difficulty in bringing the lips of the wound together.

If necessary, no doubt parallel incisions could be made to diminish tension, as is sometimes done in the operation for broken knee, but I have never found them necessary and cannot recommend them.

In the neighbourhood of the loins the skin is thick, tense, not very elastic, and there is some difficulty in bringing the lips of the wound together. In this region it should never exceed $3\frac{1}{2}$ cm. in width.

As a rule the long axis of the incision should correspond with that of the cicatrix, but the direction in which the skin is most mobile must be always remembered, as the union of the edges of the wound, "the most difficult part of the operation," is always easier to accomplish if the incision is made in one direction than in another—*i.e.*, in some cases parallel to the spine, in others perpendicular to it. It ought to be clean cut without any "tailing," and the edges absolutely parallel to each other. It should extend *through* the panniculus, a portion of which, equal to the skin, being removed with it.

The flap of skin and muscle, being separated, is detached by seizing it with the forceps, the adhesions being separated by the scissors. It is important to remove all the skin that is not normal, as sutures early tear out of cicatricial tissue, and all bleeding should be stopped, "which can be done by pressure forceps," before the edges of the wound are brought together.

The sutures must be strong, and it is sometimes advisable to insert a double one in the middle. They should be interrupted, and it is best to commence at the upper angle of the wound, putting them in at from three-eighths to one quarter of an inch apart. Depending on the size of the piece of skin removed, from fifteen to thirty points will be required.

When the sutures have been passed and tied, the surface of the wound should be carefully cleansed and dried, slight pressure being used to break up and expel the small blood-clots that form under the skin. A thick pad of cotton wool is then applied, and over it a piece of wood twelve inches by eight inches, which is kept in position, with slight pressure, by an assistant to act as a tampon, and prevent capillary hæmorrhage, until the animal recovers from the anæsthetic and gets on his feet, when a permanent dressing can be applied. This can be kept in its place by a surcingle, or, what is preferable, a cotton cloth bandage seven yards long by ten inches wide, which can be wound round the body, and retained in position by a breast-piece of the same material.

The patient must be tied up short by the head, and not let lie down, till cured; he should not be moved for a week and fed lightly and sparingly. The dressing can be removed in a week or eight days, and if the asepsis has been perfect the wound should have commenced to unite. The sutures should be removed about the fifteenth day, when exercise may be commenced. The following are the chief accidents that are to be feared:—

1. If the asepsis has been insufficient there may be a small amount of suppuration at the middle of the wound where the tension on the sutures is greatest, and they may tear out. This will be discovered when the dressing is removed at the end of a week.

Irrigation, with a solution of corrosive sublimate, with iodoform and a dressing of absorbent wool, will in the vast majority of cases rectify this accident.

2. If the bleeding is not completely stopped a blood tumour may form

under the cicatrix. It should be punctured so as to avoid interfering with the sutures, irrigated with corrosive sublimate, and a drainage tube inserted with a pad of absorbent cotton wool. The accidents of this nature that I have met with have not left serious results, and the wound has healed up well.

3. In one or two cases the wound has opened when I have removed the sutures on account of a blood clot having formed that prevented the edges uniting. I washed the clot out and applied iodoform and a cotton wool pad with pressure. In a week a cicatrix about one quarter of an inch wide had formed, and no evil resulted.

Such accidents will take place when a large number of horses are operated on, but in my experience without any very bad results. The healing of the wound is slightly retarded, and cicatrisation is not perhaps quite so perfect, but rapidly becomes insensible to the friction of the saddle, as there is no adherence with the deep-seated tissues. When the operation has been successful, the cicatrix is perfect at the end of about fifteen days. It is then of a pink colour, already covered with epidermis, and from one-sixteenth to one-eighth of an inch wide. It is insensible, not swollen, and the skin quite mobile and without any adhesion to the deep tissues, and after the lapse of a few months it is hard to discover any trace of them.

I have operated in about forty cases, and none of them have been aggravated; in fact there has been a radical cure in about a month, although the cicatrix is still delicate. Some were ridden for about four consecutive hours six weeks after the operation, but the epidermis over the cicatrix was somewhat abraided, and complete cure retarded, so it would appear that the animal should not be ridden for at least two months.

In three or four of my cases that were badly injured I have removed two or three flaps, 6 to 8 inches in length by $\frac{3}{4}$ to $1\frac{1}{4}$ inches wide, on the same day, from the same side of the back, and in three to four weeks afterwards operated in the same manner on the other.

When it is necessary to remove a very large flap, half may be removed at one operation and the remainder at a second a month later.

In conclusion, I would say that it is essential to use an anæsthetic, as without it asepsis is nearly impossible, and the sutures cannot be properly inverted.

(*Receuil de Médecine Vétérinaire*, Oct. 15 and Nov. 15, 1902.)

WE beg to draw our readers' attention to the appointment of Messrs. Huish and Company as sole agents in Great Britain and Ireland for the Biological Products of the Pasteur Vaccine Company. We have frequently used some of the Company's products, and found them most reliable.

Amongst their specialties are Antitetanin, Tuberculin, and Black-leg Antitoxin.

LICTOR.

We have received a sample of an iodine mixture called "Lictor," which is valuable as an absorbent, without producing much irritation. It is prepared by Messrs. Waller, Malvine, and Company, London.

TO OUR READERS.

Being fully aware that a thorough knowledge of all the diseases of Mammary Glands is of vital importance to human beings, we have obtained the plates and copyright of this admirable work, and Veterinary-Lieut.-Colonel Nunn has kindly undertaken its translation into English. We published the first portion in June 1902, *and shall continue to publish it in monthly parts, and afterwards in book form.*

DISEASES OF THE MAMMARY GLAND.

BY P. LEBLANC, LYONS VETERINARY COLLEGE—TRANSLATED BY VET.-LIEUT.-COLONEL NUNN, A.V.D., F.R.C.V.S., ETC.

(*Continued from page* 348, *vol.* V.)

PHYSIOLOGY.

WHILE the animal remains virgin no change takes place in the gland ; it remains as an accessory organ, and as such may continue during life. When impregnated it enlarges, sometimes to a very considerable extent, and becomes œdematous. This œdema in the cow frequently extends to the umbilicus and up between the thighs, obliterating the normal limits of the organ, the teats appearing to be buried in the surrounding tissue.

This increase in volume, with its accompanying tension, is sometimes termed *mammary congestion.* It is a physiological process, and is often very marked, more especially when the animal is young. or, in other words, when the gland is less prepared for the exercise of its functions. Being entirely a physiological phenomenon, we do not propose to enter into further discussion, as it is not accompanied with any trouble, although it is a valuable indication that the gland is entering into a state of activity.

Shortly after parturition the tension and œdema disappear, and the gland returns to the form and dimensions it retains during the period of lactation.

The tension is caused by the enormous influx of blood required for the proper performance of its function, and the veins not being prepared for the return current, stasis takes place, the most marked symptoms being the œdema which is absorbed when they, "the veins" dilate, and the return flow is fairly established.

The blood carries to the gland the necessary materials for secretion, certain of these being simply filtered, such as water, albumen, and salts ; others, on the contrary, are formed by the cells, viz., caseine, fat, and sugar, the resulting product being the milk.

The first milk is known as *colostrum*, which has purgative properties attributed to it. Amongst primaparæ and animals whose mammæ have never been active it is scanty, but abundant in multiparæ.

Milk is intended by nature to be the sole food for the young, and its composition varies in the different species :—

	Cow.	Goat.	Ass.	Woman.
Water,	86·33	86·85	89·01	87·24
Solids,	13·17	13·52	10·99	9·42
Caseine,	3·23	2·53	3·57	2·91
Albumen,	0·05	1·26		
Fat,	4·50	4·34	1·85	2·67
Sugar,	4·93	3·78	5·05	3·15
Salts,	0·61	0·65		0·14

The secretion lasts for a variable time in different species, according to the requirements of the young. Guinea-pigs are able to move about an hour after birth, and to eat ordinary food in two days. In milking animals the secretion lasts long beyond the requirements of the young animal, and this is induced artificially by the handling of the teats.

THE MAMMÆ AS AN EXCRETORY ORGAN—MORBID SECRETIONS.

Before puberty the gland remains dormant. In both young and very old animals it is small, consisting of a mass of connective tissue in which the gland elements exist, but in an undeveloped condition. The gland becomes active just before parturition, increasing in size, being round, and dropping down. A large proportion of the blood that was required for the growth of the fœtus is diverted to the udder and utilised in the secretion of milk, which is now required for the nourishment of the newly-born animal.

As was the case while *in utero*, the young animal lives the same life as the mother, many causes that affect her health being remitted to the offspring. Like the blood, the milk becomes the vehicle for injurious products formed in the body of the mother, either by abnormal physiological or pathological processes.

Even if the gland itself is incapable of elaborating deleterious excretions, it allows those that are present in the blood to pass through it, and without doubt plays an important part in the process of elimination, the milk being capable of receiving certain constituents which normally are foreign to it,—viz., soluble and odoriferous principles and micro-organisms.

1. *Soluble Matters.*—Any one who has had to do with milking animals is aware that the quality of the milk is liable to variations according to the condition of the animal.

There is no occasion to mention a state of disease, as no one will deny that under such conditions the milk will undergo changes.[1]

There are, however, other less known factors to be remembered. Of these *feeding* is the most important. This is proved by the

[1] Gaffky has reported three cases of enteric fever in man caused by milk contaminated by excreta from a cow suffering from hæmorrhagic enteritis. In America a peculiar disease, known as "lait," is recognised amongst cows, said to be caused by drinking sea-water. It is said to be communicated to human beings through the milk of affected animals, and is characterised by weakness of the limbs. Veræffent, des Kais gesundh. No. 33 der Thierarzt. 1886, No. 30.

well-known fact that if sucking sows get too heating or tonic food the young pigs are liable to disorders, which cease when the mother is put on to a more hygienic *régime*, proving that the milk possesses certain irritating properties. The same is seen with the calf, and if the milk from such a cow is used for invalids or infants it is very soon followed with colic, indigestion, and diarrhœa.

Permanent Housing has equally well-marked effects.

Work influences the quality and the quantity of the milk more than its taste. Volpe has shown that after work there is a loss of 1·120 butter, 0·44 caseine and albuminoids, and 0·55 sugar; also it is slightly acid.[1]

Œstrum has an effect on the milk. In many cases it has a strong smell, and in the case of nymphomaniacs the meat has a disagreeable odour, which, however, is removed by cooking, and in this the milk usually participates. Cornevin in his treatise "Traite de Zootechnie," mentions that calves sucking mothers that were in season became attacked with diarrhœa.

It is well known that certain drugs are eliminated by the mammæ, their presence being detected in the milk. Guinard has detected certain bitter and purgative agents by their taste and properties; Baum, tartar emetic; Klingeman, alcohol; Fubini and Bonani, atropine; Gunther and Harms, camphor, ether, turpentine, assafœtida, and chloroform; Hertwig and Spinola, aloes and arsenic; Fubini, strychnine, salicylic acid, carbolic acid, lead salts, mercury, iodine, and the alkaloids of opium.

2. *Aromatic Substances.*—The milk of animals fed on certain plants, especially garlic and turnip, is tainted with the characteristic smell, also that of goats in certain localities in which wild thyme abounds.

Cows fed on the refuse pulp from beetroot-sugar factories give milk a mawkish unpleasant taste, and certain plants, such as alkanet (*anchusa officinalis*), field horse-tail (*equisetum arvense*), meadow saffron (*colchicum autumnale*), and knotgrass (*polygonum aviculare*) are said to impart colour to it.

Enaminations will communicate their particular smell, and for this reason cow-houses should be disinfected with odourless disinfectants. It has been contended that where carbolic acid has been used that the milk has produced nausea and vomiting when partaken of, whether boiled or raw (Dr. Veitch).

We have seen a case of a herd of twenty-five cows, the milk of which had a disagreeable odour. The carcase of a dead horse in a state of decomposition was discovered hidden in a wood near where they grazed. When this was buried all complaints ceased.

Micro-organisms.—It is generally stated that micro-organisms contained in the blood are not eliminated in the milk, but this is by no means proved. It is well known that under certain conditions red blood corpuscles are found, and this would tend to prove the probability of micro-organisms finding their way also.

[1] Volpe. Centralb. fur Allgem. gesundheil. 1886.

PHYSIOLOGICAL ANOMALIES.

Secretion of Milk independent of Gestation.—This anomaly is known as heterochronic lactation. Observations on the points have been made with human medicine by Scanzoni de Natales,[1] Guillot,[2] Gubler,[3] and De Sinety,[4] who have demonstrated that a minute quantity of milk is frequently present in the mammæ of newly born infants. The same fact has been recognised in fillies by Lacoq, Mazure, Dayot,[5] Lemaire,[6] Hamon,[7] Grenat,[8] and Gathelier.[9] In the case recorded by Mazure the udder of the filly was the size of the two clenched fists, in that of Grenat milk appeared the day after birth and lasted for twenty-three days.

As far as is known, heterochronic lactation is not known in any of the other species.

The secretion of milk may make its appearance some time before parturition without the subject being pregnant, in which case there is either some sexual excitement or stimulus to the gland. Baudeloque notes the case of a girl of eight years of age suckling an infant for a month.

Harvey mentions that doe rabbits that have been covered but not impregnated showed signs of mammary activity at the time parturition should have been due.

Buffon, Rainard, and Delafond [10] noticed the appearance of milk in a bitch, that had been to the dog, but had not held, at the time when she should have pupped had she been pregnant; but this has been questioned. Bitches are, however, frequently observed under the same conditions to have the glands swollen, and retire and prepare a bed for themselves. It is evident that this sudden flow of blood to the gland is in relation to disturbance of the generative system.[11]

In most of the domestic animals the secretion of the milk can be accelerated by manipulating the gland. This fact was well known to the ancients, Aristotle mentioning that it was the custom amongst the goat-herds of Mount Etna to cause virgin goats to milk by this method.

Cornevin, in an article dated 1876, states that he has been told by French peasants that they are often able to produce milk from she-goats by drawing and manipulating the teat just before bringing to the buck, and Gelte confirms this.

[1] Scanzoni. Verhandl. der phys. méd. gesell. zu Wurzburg, T. ii. No. 29, page 852.
[2] Archiv gen. de méd.
[3] Mem. de la Soc. de biol. 2nd series, vol. ii.
[4] Archiv de Physiol. 1875.
[5] Dayot. Recueil, 1854, page 850.
[6] Lemaire. Recueil, 1854, page 475; 1861, page 1852; 1875, page 55.
[7] Hamon. Recueil, 1858, page 311.
[8] Grenat. Ann. de méd. vét., 1861, page 197.
[9] Gathelier. Bull. de la Soc. des sc. Vét. 1898, page 25.
[10] Société Centrale, 1857, pages 460 to 469.
[11] Joly and Fibhol have observed the same and examined the milk of the virgin bitch, which is identical with that secreted after parturition.

Limbourg[1] has seen a four-year-old mare in milk that was not in foal, and whose udder had never been touched. Bru[2] also reports the case of a two-year-old filly giving milk after being tied up next to a she-donkey that used to lick her.

In the *Veterinarian* of 1856 a case is reported of a mare twenty years of age, that had been pregnant, nursing a foal whose mother had died. Broad records a case of a filly that gave about two pints of milk per diem for several days.[3] The same has been seen in heifers. Luteyn Mazure[4] mentions one whose udder increased in size so much that she was thought to be in calf. It remained so for forty days, until it resumed its normal size. About the same time the following year she again gave daily about three-quarters of a bucket of milk, which came in a jet from the teat.

Lloyd[5] has seen a heifer in milk that was five months in calf.

Laho and Courton[6] have seen a five months old animal which continued to give milk for six months. The quantity was about seven pints, and to all appearances it was good in quality and normal.

Dr. Douges de Guanajato reports the case of a she-mule giving milk. Barbe de Bayas[7] has related a curious case of a spayed sow that was shut up with a young pig. The sow began to rapidly fall off in condition, when it was noticed that her teats were enlarged, were full of milk, and the young pig was sucking at her.

Gavard records an analogous case in a goat six months old,[8] and Colin at the Alfort School in a six months lamb.

It is not uncommon to see the gland swell and give milk in virgin bitches, who acquire a trick of licking the parts: no doubt this induces sexual excitement and is a habit difficult to stop. The best plan is to tie the animal up, give a purgative, and apply something nauseous to the teat.

Lactation in the Male.—The case of the buck goat mentioned by Aristotle is well known, and according to him this phenomenon was transmitted by the animal to certain of his male progeny. Blumenbach records that he saw at Gottingen a buck that gave eight ounces of good milk daily.

Koschate also reports a three-year-old buck that in front of the rudimentary teats had a mammary gland the size of an apple, with two well-marked teats on it. The animal gave about what is described as "a *glass*-ful" of milk daily.

Geoffroy Saint Hilaire has seen one that gave about three-quarters of a pint of milk daily, and Cornevin one with well-developed teats which he recorded in his Zootechnie.

[1] Limbourg. Ann. de méd. vét. 1873, page 591.
[2] Bru. Revue Vétérinaire, 1890, page 21.
[3] Broad. Veterinarian, 1864.
[4] Mazure. Ann. Vétérinaires, 1854, page 96.
[5] Lloyd. Veterinarian, February, 1878.
[6] Laho and Courton. Ann. Belge, 1876, page 141.
[7] Barbe. Revue Vétérinaire, 1883, p. 117.
[8] Gavard. Journal de méd. vét. et de Zootech. Dec. 1893.

G. Colin is of opinion that this is anything but exceptional.

In the human being castration will cause mammæ to develop; a case of this in a bull has come under our observation.

CONGENITAL ANOMALIES.

These are not common, but cows have been noticed with absence of the mammæ.[1] Lafour mentions one in which the foal was nearly starved before it was discovered that the mare suffered from this deformity. When present there is generally more or less complete hermaphrodism.

When there are more than the normal number of glands, the deformity is termed polymastic, and is much more frequent than the former condition, but generally it is not an extra gland, but a teat: the first is uncommon, but the latter often seen.

In animals with several mammæ the numbers vary considerably; and it is commonly said with sows that there is a teat for each pig born.

In the cow supplementary teats are often seen, generally two; more rarely four, situated behind, and below the two normal posterior ones. Then supplementary teats frequently have a canal perforating them, and it is not uncommon for them to give milk.

M. Sanson has seen a cow with seven teats, all of which gave milk, and Jansen states that supernumerary teats are connected with a supernumerary gland.

In the goat the supplementary teats are in the reversed position to those of the cow.

ACQUIRED ANOMALIES.

Atrophy and hypertrophy of the mammæ may be classed under this heading.

Atrophy in the cow may generally be traced to a previous attack of mastitis which obliterates the acini. In aged animals this may be due to prolonged inertia of the organ or to bad food. Obstruction of the teat when neglected will cause atrophy of that particular quarter. Watterwald mentions an interesting fact that atrophy of the udder will supervene after certain diseases of the ovaries or uterus.

When a section of an atrophied udder is examined under the microscope it will be seen that it is transformed into a fibrous mass, the acini and gland tissues being choked up and shrivelled.

The appearances are different if the atrophy is due to inflammatory process, or from an obstruction arising during the course of lactation.

In the latter case the changes in the gland are such as might be

[1] M. Sanson mentions a five year old Durham cow with complete absence of an udder, but there were four small rudimentary teats; M. Goubaux a cow with but three teats.

expected if it had been dormant, in the former the functions of which have ceased by destruction of its elements.

This latter class is incurable; in the former the diminution is only temporary, and secretion may be restored if the obstacle to the flow of milk is removed.

Hypertrophy is sometimes due to a pathological process, and is seen in cows with mammitis, accompanied with abundant vegetations on the mucous membrane of the sinus. The quarters attacked remain larger than those that are active. Hypertrophy is also seen in milking animals, and is the result of breeding and manipulation of the udder.

In cases of pathological hypertrophy the secretion is suppressed, and there is alteration in the consistency of the gland. In normal hypertrophy the functions are at their maximum.

INJURIES.

1. *Contusions.*—Contusions of the mammæ are common in animals that have largely developed and pendulous udders, and are often seen in the ewe and goat, more rarely in the cow. They are rare in the bitch, but if existing, the last pair, or last but one, are those generally involved. Old bitches that have had many litters, and whose udders are pendulous, are most exposed to injuries, and this accounts for the fact that in these animals tumours are more frequently developed in the posterior than the anterior mammæ.

In certain breeds of sheep and goats the udder hangs nearly down to the ground, and is liable to injury in rough, rocky pasture also to be bruised by the hind limbs.

In certain breeds of cows the udder is so largely developed that when they move the hind limbs are straddled apart, and in such it is liable to bruises and chaffing.

The calf, in sucking, when he butts with his head is likely to injure his mother. Kicks, blows with the horn of another animal, and contact with stakes, &c. are all causes, also the habit some cows have of trying to jump the fence of the field.

Repeated blows on a very pendulous udder are more dangerous than a single one, and the consequences are not so serious if inflicted after the calf has begun to suck as they would be before.

Contusions can be divided into two classes:—*1st.* When there is only a slight bruise that can hardly be looked upon as a contusion. *2nd.* When there is subcutaneous or interstital hæmorrhage, which is quickly followed by ecchymosis of a greater or less extent on the seat of the injury. If the blow is violent the blood may collect and form a hæmatome, or the gland tissue may be lacerated or disintegrated. Rodet[1] reports the case of a bitch that received an injury on the mammæ resulting in a large hæmatome. A cure was effected by the application of leeches.

[1] Rodet. Engorgement squirrheux de la gland mamaire. Recueil de Médécine vet., 1827, page 42.

Besides the local symptoms of ecchymosis and subcutaneous infiltration, there is often great pain when the animal is milked, and, if the blow is severe, lameness of one or both the hind limbs.

In the bitch repeated blows are a common source of chronic mastitis and the formation of adeno-fibroid tumours.

Frequently the injury is not noticed, but when there is pain, treatment is necessary to preserve the secretion of milk and prevent the complication of mastitis and formation of abscesses. A sedative ointment of opium or poppy heads accompanied with massage, is usually sufficient to afford relief.

WOUNDS.

Wounds of the mammæ are generally found in the cow, goat, and ewe, in which animals the gland is more exposed than any others.

Common causes are sharp substances, such as broken glass in the bedding, stabs from a pitchfork, bites of dogs, injuries from barbed wire-fencing, and, as M. Chanel states, bites of vipers.

In cases of aphtha or variola, after the pustules have broken a raw surface of greater or lesser extent remains, that may run on into rupture of the integument and tissue of the teat. Gellé relates a case of a cow in which there was rupture from the point to the base into the canal, with an escape of milk and blood.

Accidental opening of the sinus or canal is often followed by a lacteal fistula.

Before the introduction of antiseptic surgery wounds of the udder were considered to be specially dangerous, and even now they are a serious matter on account of the large number of lymphatic and blood vessels that are in this region. They appear to be peculiarly liable to become gangrenous, and this is noticed in practice when it is necessary to resect the canal for stricture or to amputate the teat. Wounds of the mammæ do not require any special treatment, but care should be taken to prevent them being contaminated by the bedding.

Lacteal Fistula.—This complication is liable to occur when a wound is inflicted on an active gland, penetratiug the sinus or canal. If neglected it never cicatrises and an opening remains. The fistula is often marked by a small protuberance with indurated borders, from which there is a constant trickle of milk down the teat. This protuberance is generally on the upper part of the cicatrix, and the affected teat is almost always crooked.

The fistula sometimes opens into the sinus, sometimes into the canal, and as long as the animal remains in milk has no tendency to heal. When the patient becomes dry, in some rare instances it may close, but usually it remains unnoticed, and when she again comes into milk it is discovered to be still patent. The lesion is a serious one, and any surgical measures must be postponed until the animal is dry.

It is seldom that the cow is seen soon enough to allow of healing by the first intention ; usually granulations have sprung up round the edges of the wound. If sutures are attempted in this stage all antiseptic precautions must be taken, and the part covered with a layer of iodoform and collodion. A milk syphon must be passed three or four times a day to draw off the milk and keep the canal patent. It is usually, however, better to wait till the animal is dry, and then pare the edges of the fistula and suture it.[1]

ABRASIONS, CHAPS, AND FISSURES OF THE TEATS.

These are purely diseases of milking animals, and are generally seen in the cow, especially in those breeds with largely developed udders, pendulous teats, and fine skin. One of the most common causes is the teat being kept wet with saliva after the calf has done sucking, but it will also be produced by cold and the irritating properties of soiled bedding.

Symptoms.—An abrasion is usually the first symptom, running on into a fissure. It may pass unnoticed if slight, and merely exist as a number of small, red cracks, radiating from the orifice of the canal up the teat in either straight or serpentine irregular lines. They are very shallow, and do not cause any pain, and the first thing that attracts attention is the presence of blood in the milk after the calf has been sucking. These small abrasions run on into deep fissures, from which oozes a discharge, and which at the bottom are of an unhealthy yellow or red colour. The teat is enlarged, hot, and painful, and the lymphatics corded and swollen. The animal resists the calf sucking or the teat being handled, and there is no tendency to a spontaneous cure. In some cases the sphincter is implicated, and an obstruction of the canal takes place.

Treatment.—The teat should be carefully dried as soon after the calf has done sucking as possible. If a fissure has formed, the calf should be taken away and reared by hand. The cow must be milked carefully, and the udder completely drained, but if she will not stand this on account of the pain, the milk syphon must be passed.

If possible, each time the calf has finished sucking, or after the syphon has been passed, a suspensory bandage should be applied both to support the gland and to keep it from contact with the bedding. This is, however, sometimes a matter of difficulty.

The part should be carefully washed several times a day with a solution of boracic acid and dried with a piece of absorbent cotton-wool, and an ointment of 1 part boracic acid or aristol to 5 of vaseline applied (Vinay).

If the pain is great, opium and vaseline ointment, 10 per cent., applied after bathing with any warm antiseptic solution will give relief. Cocaine ointment made up with vaseline, 5 per cent., may be tried, but it diminishes the secretion of milk.

[1] P. Leblanc. Fistule Lactee absces etc. Journ. de Lyon, 1899, p. 332, A. Lucet, Apropos d'un cas de fistule lactee. Journ. de Lyon, 1900, p. 20.

Trasbot recommends equal parts of starch and glycerine, and in old cases iodine and glycerine.[1]

If the wound shows no tendency to cicatrise, it will have to be cauterised with nitrate of silver.

Note by Translator.—In cases of sore nipple in the human being bismuth and olive oil is recommended. I have used it with success in veterinary practice.

Legal News.

Before Mr. Justice Ridley and a Common Jury.

MILTON *v.* PRONK.

THIS was an action by jobmasters to recover £86 for the hire and livery of horses. The defendant admitted the amount of the claim, but counter-claimed for damages for injuries to a mare which he had put out to graze with the plaintiffs.

Mr. Horace Avory, K.C., Mr. George Wallace, and Mr. Lacey Smith appeared for the plaintiffs; Mr. Bray, K.C., and Mr. James Gray for the defendant.

Mr. Bray, in opening the defendant's case on the counter-claim, said there had been dealings for some time between the plaintiffs, who were horse-dealers and jobbers, and the defendant. In July 1899 an arrangement was made that defendant's mare should be taken in by the plaintiffs at 7s. 6d. a week on a farm at Hendon. On July 8 Mrs. Pronk went down to see the mare, and found her all right. Three weeks after, the plaintiffs told Mrs. Pronk that the mare had been injured. The mare was a mere skeleton, and scratched and torn in the hind legs. Mrs. Pronk was told that the mare had got her leg through a hedge. She saw a quantity of loose barbed wire in the field and a broken ploughshare. Eventually the plaintiffs sent the mare back to the defendant. Mr. Gray, a veterinary surgeon, examined the mare and found her permanently injured. The defendant wrote to the plaintiffs complaining, and they replied that the mare was taken at the owner's risk. The law was that the agistor of a horse had to take reasonable care of the horse. The plaintiffs set up a custom that an agistor was not liable.

Mr. Avory said they did not undertake to do more than take reasonable care that the field was a proper one for a horse to be turned into; and that she would not get out into another field. They took no responsibility for an injury that a horse did to itself.

Mr. Bray, continuing his opening, said there was no bargain that the plaintiffs would not be responsible. It was said the animal was injured by its inherent vice. The plaintiffs removed the mare into a field with other mares at a time she was in season. As to damages, this was a pet mare,

[1] Trasbot, art. Mammary Glands, Dict. Bouley et Reynal; Fleming, Veterinary Obstetrics, art. Diseases of the Mammary Gland; Rainard, note on Diseases following Parturition, Journal de Lyon, 1845; Zundel, Dict. Hurtrel d'Arboval, art. Mammary Gland; Vennerhoem, Handbuch der Thierarzt. Chirurgie, art. Mammary Gland; Saint Cyr and Violet, Traite d'obst. vet., Diseases of the Mammary Gland, page 771.

but she did not claim damages in respect of that. At four she cost £65, and was at the time of the accident eleven years old, and should be worth £75. Now she was only worth £15.

The defendant and his wife gave evidence that they saw a lot of barbed wire about in the field and barbed wire in the fences.

H. Gray, veterinary surgeon, called, said the injuries were caused by barbed wire. He thought it negligent to turn town horses out into a field with barbed wire fencing.

Professor W. Pritchard said he thoroughly disapproved of barbed wire. He had seen terrible accidents to horses turned out into fields fenced with barbed wire.

Cross-examined.—He suggested that barbed wire fencing for horses was improper under any circumstances.

W. Hunting, F.R.C.V.S., said he thought barbed wire was not a proper thing to have in a field where horses were grazing, nor to have mares in season in the same field with other mares.

Mr. Avory, in addressing the jury for the plaintiffs, said if the jury came to the conclusion that the mare was injured by attempting to jump the fence in which there was barbed wire, then a question of great importance to the farming interest of this country arose—namely, whether the presence of barbed wire in a fence was negligence in the person who used it. It was universally used on farms where cattle and horses were put out to graze, and therefore he contended that owners of horses put out to graze took the risk of injury from barbed wire in the fences. He submitted that the field was reasonably fit for the purpose, and there was no negligence.

Mr. W. Milton, one of the plaintiffs, said he was a jobmaster, carrying on business in Park Lane. He owned and leased farms at Hendon for the purpose of his business. There was barbed wire on the off-side of the fence belonging to the adjoining occupier. There was no barbed wire in the field. He had grazed 1200 to 1500 horses on the Grove Farm during the last twelve years, and had never had an accident like this before. Barbed wire fencing was extensively used round there. By custom the agistor took no risks, except from straying.

Cross-examined.—He filled up gaps with a single strand of barbed wire.

Frederick White, foreman in employ of the plaintiff at Hendon, said there was no barbed wire about the fields, only in the boundary fence.

H. W. Cator, examined, said he was a veterinary surgeon. Nine-tenths of the farms where horses were turned out to graze used barbed wire. He was veterinary surgeon to an insurance society, which made no extra charge when barbed wire was used. He thought the fences in question fair. In his experience owners of horses taken in to graze always took the risk of horses injuring themselves by jumping the fences.

A. H. Jacobs, veterinary surgeon, examined, said he had a horse turned out at Grove Farm. The fences were in a proper condition. Barbed wire in the fences was not unreasonable.

William Yells, a grazier and farmer at Hendon, said he took horses in to graze. He took no risks.

John Wallace, farmer at Hendon, said he had taken horses in to graze. They came at the owner's risk.

Mr. Justice Ridley, in summing up, said the question was whether the

plaintiffs took reasonable care of the mare. He thought the law was that, if a man took a horse out to grass he was bound to take reasonable care, and there was no custom of the country against that. He was bound both as regards the field and the fence to take reasonable care. If he had provided a proper fence, then the agistor would not be liable if the horse was injured by trying to jump it. It was suggested that if the animal was injured by barbed wire in the fence, that was want of care on the part of the agistor. It was said, on the other hand, that barbed wire was a proper thing in a fence where horses were to be grazed. How were they fenced in before? This barbed wire was a new thing, and he did not see why it was necessary. What did they think of such a fence for a horse sent down from London, a horse that had never seen barbed wire before? His Lordship then left the following questions to the jury:—(1) Was the accident caused by the mare trying to jump the fence? (2) Was she torn by the barbed wire in the fence? (3) How was the accident caused? (4) Did the plaintiffs use reasonable care as to the field and the fence, and as to putting her in the other field?

The Jury said they were of opinion that the injuries were caused by barbed wire lying loose on the ground, and they also found that the plaintiffs did not use ordinary care as to the fence and the field, as barbed wire was not suitable, and was dangerous to horses. They assessed the damages at £45.

Judgment for the defendant for that amount on the counter-claim.

(*Times*, Dec. 12, 1902.)

Reviews.

KOMPENDIUM DER BAKTERIOLOGIE UND BLUTSERUMTHERAPIE FÜR TIERARZTE UND STUDIERENDE (COMPENDIUM OF BACTERIOLOGY AND BLOOD-SERUMTHERAPY FOR VETERINARIANS AND STUDENTS), by Dr. JESS. Berlin: Schoetz, 1903. 2nd ed. 142 pp. Price 4 marks (=4s.).

We can confidently recommend this excellent manual to those of our readers who desire to keep pace with the most recent results of the ever-advancing science of bacteriology. To those who read German this work supplies a long-felt want, giving as it does a summary of a literature which may now be said to be vast in its dimensions. A busy practitioner who has not the leisure to investigate great masses of detail will find Dr. Jess's little book a perfect godsend. Besides being beautifully printed, it is enriched with twenty microphotographs and eight diagrams, the former being admirably clear and unmistakeable. They are mostly taken from pure cultures made by Dr. Piorkowski. Such preparations are photographed as can be easily determined by the practitioner himself, and the photographs offer a useful table for purposes of comparison.

The section on Immunity embodies the important results of Ehrlich, Bordet, and Wassermann; that dealing with Blood-Serumtherapy contains, among much that is useful, the conclusions of Ostertag on Swine Fever. The introductory sections deal succinctly yet clearly with methods of preparing cultures, and with the most favourable media; this part of the

book is that which will perhaps prove most valuable to the beginner in bacteriology. Diagnostic injections have a special section devoted to them, rendered still more valuable by a table of injections with the headings—disease, experiment, animal, matter inoculated, method of inoculation, time of death. This is followed by an interesting and up-to-date chapter on Protective Inoculation, in which due attention is given to the use of mallein in glanders, among other things of importance. A discussion on application of blood-serumtherapy to animals, we should mention, is followed by one on its use in relation to human diseases—tetanus, diphtheria, cholera, tuberculosis, streptococcus, and rabies. For those who intend going more deeply into the subject, a short synopsis of bacteriological literature is appended. An English translation would be a welcome addition to our veterinary literature.

TABLEAUX SYNOPTIQUES POUR L'INSPECTION DES VIANDES (SYNOPTICAL TABLES FOR MEAT INSPECTION), by Dr. Ch. Manget. Paris: J. B. Baillière et Fils. Pp. 88. Price 1s. 3d.

This little book is one of a series of synoptical tables sent forth by the same publishers to which Dr. Manget has already contributed, and which have for their object the placing before the reader, be he doctor, chemist, or veterinarian, a number of facts in connection with the various subjects in a clear and concise manner.

In these days, when the professional man has to accomplish the maximum of work in the minimum of time, such works as this series contains are simply invaluable, for when making an analysis it is almost impossible to follow at the same time the long descriptions given in the average text-books.

Such is not the case with the present work, for Dr. Manget has in the first place condensed his information into the smallest number of words, and then by columnar arrangement and the judicious use of brackets he has arranged it so that it is easy to follow out in any specific case the necessary details.

As the author remarks in his preface, the aim of this book is not so much to give information to the expert as to assist those whose previous training has not been so thoroughly practical as to enable them to discriminate with certainty between good and bad in the matter of meat supplies (not so easy a task as at first sight may appear, for it is extremely difficult to say what shall be accepted and what rejected), and also to enable the reader to arrive at an accurate conclusion as to age and condition of the living animal.

Thus the book is divided up into such sections as "The State of the Animal during Life," "The Slaughtered Animal," "Meat Inspection," &c., and is illustrated by several diagrams, which in respect of those of certain animals are extremely helpful. As regards those of bacilli, one naturally feels that black-and-white drawings of such, though useful in explaining the test, would be quite inefficient without a certain amount of previous knowledge on the part of the observer.

This is an excellent and handy *vade-mecum*, for it is of such a size as to fit the pocket, and is in addition well printed and strongly bound.

Army Veterinary Department.

Uniform—Blue. *Facings*—Maroon Velvet.
Agents for Payment of Officers of Army Veterinary Department at Home—
Messrs. HOLT & Co., 3 Whitehall Place, S.W.

Director-General—THOMSON, Veterinary-Colonel H., C.B., 15 Oct. 1892, War Office (66 Victoria Street, S.W).

Veterinary-Lieutenant-Colonels.

Clayton, C.	7 Aug. 1890	Aldershot, P.V.O. 1st Army Corps.
Glover, B. L., C.B.	28 June 1897	Headquarters, India, Temp. Vet.-Colonel.
Matthews, I., C.B., Vet.-Colonel,	23 April 1898	S. Africa, Pretoria, P.V.O.
Smith, F., C.M.G.	15 Nov. 1899	S. Africa, Cape Town.
Nunn, J. A., C.I.E., D.S.O.	1 April 1900	War Office, Deputy Director-General.
Flintoff, T., D.S.O.	23 Feb. 1901	S. Africa, Bloemfontein, P.V.O. Orange River Colony.
Pringle, R., D.S.O.	11 Dec. 1901	Dublin, P.V.O. Ireland.
Moore, R.	3 May 1902	Bengal, Ninie Thal, P.V.O. Bengal Command.
Rutherford, C., C.M.G.	17 May 1902	S. Africa, Pietermaritzburg, Natal.
Lees, K.	—	Madras, Ootacamund, P.V.O. Madras Command.
Forsdyke, F.	—	S. Africa, Elandsfontein, Western Transvaal.

Veterinary-Majors.

Philips, J. J.	1 April 1893	S. Africa, Middleburgh, Cape Colony.
Duff-Gillespie, S.	26 Sept. 1894	On passage to England.
Savage, J. B.	30 Oct. 1898	Bengal, Acting P.V.O. Bengal Command.
Dibben, J. T.	15 Mar. 1899	Bengal, Lucknow.
Day, E.	17 May 1899	Clonmel.
Short, F. J.	24 Jan. 1900	Murree, Punjab, Acting P.V.O. Punjab Command.
Griffith, G. R., D.S.O.	26 May 1900	Egyptian Army, Local Vet. Lieut.-Colonel.
Cooper, J.	11 Sept. 1900	Sick leave from South Africa.
Hazelton, E. H.	29 Nov. 1900	Bombay, Poonah, Acting P.V.O. Bombay Command.
Blenkinsop, L. J., D.S.O.	do.	On passage to England.
Raymond, R. W.	do.	S. Africa, Middleburgh.
Moore, J.	do.	Remount Depôt, London.
Appleton, A. F.	20 Mar. 1902	Bengal, Jubblepore.
Nuthall, C. E.	do.	Acting D.V.O. 3rd Army Corps, Curragh.
Marriott, T.	do.	Acting D.V.O. 2nd Army Corps, Salisbury.
Butler, E. R. C.	do.	Army Veterinary School, Aldershot.
Fowler, G. C. O.	do.	Madras, Acting P.V.O. Madras Command, Ootacamund.
Meredith, J. A.	do.	1st Life Guards, Hyde Park Barracks.
Sharp, F. W., D.S.O.	do.	S. Africa, Pretoria.
Taylor, E.	do.	S. Africa, Klerksdorp.
Barry, D. J.	do.	Punjab, Rawal Pinde.
Richardson, A. E.	do.	S. Africa, De Aar.
Walker, W. R.	do.	Punjab, Umballa, Army Veterinary School, Umballa and Simla.
Lawson, E. J.	do.	Egypt, P.V.O.

Veterinary-Captains.

Axe, H. J.	3 Feb. 1892	Bombay, Mhow.
Hunt, F. D.	do.	Bombay Remount Depôt, Ahmednagar.
Martin, E. E.	do.	Army Veterinary School, Aldershot.
Knight, H. B.	17 Feb. 1892	Madras, sick leave England.
Sullivan, H. A.	13 April 1892	Umballa, Punjab.
England, A.	28 Sept. 1892	S. Africa, De Aar.
Clarke, A. E.	21 June 1893	Madras, Remount Depôt, Hossur.
Wright, W. N.	do.	Aldershot.
M'Dougall, W. A.	do.	Punjab, Rawal Pinde.
Lane, A. H.	29 Nov. 1893	S. Africa, Harrismith.
Shore, W. F.	25 July 1894	Punjab, Remount Depôt, Karnal.
Barry, E. P. J.	22 Aug. 1894	2nd Life Guards, in temporary charge Remount Depôt, Canterbury.
Russell, W. E.	17 Oct. 1894	S. Africa, Pretoria.

Carr, F. U.	13 Mar. 1895	Woolwich.
Hunt, F. W.	20 Mar. 1895	S. Africa.
Drage, F. B.	18 July 1898	Royal Horse Guards, Regent Park Barracks.
Lewis, T. E. W.	16 Nov. 1898	Egyptian Army, Local Vet.-Major.
Larnder, E. W.	28 Nov. 1898	Exeter.
Newsom, A. C.	12 June 1899	Bombay, Poonah, Army Vet. School, Poonah.
Eassie, F., D.S.O.	11 Sept. 1899	S. Africa, Remount Depôt, Bloemfontein.
Stratton, F. C.	5 Mar. 1900	Bengal, Meerut.
Harris, C. B. M.	27 Aug. 1900	Bengal, Allahabad.
Cranford, R. L.	22 Oct. 1900	Bengal, Remount Depot, Harpur.
Smith, W. D.	29 Nov. 1900	S. Africa, Elandsfontein.
Sawyer, H. T.	do.	Woolwich.
Williams, G. M.	do.	S. Africa, Remount Depôt, Germiston.
Wilson, F. W.	do.	S. Africa, Worcester.
Peacocke, T. G.	7 Jan. 1901	Bengal, Remount Depôt, Saharunpore.
Tatam, W. J.	18 Feb. 1901	Madras, Bangalore.
Rose, C.	2 Sept. 1901	S. Africa, Bloemfontein.

Veterinary-Lieutenants.

Edwards, W. B.	12 June 1895	S. Africa, Mooi River, Natal.
Rudd, T. W.	28 Aug. 1895	Bombay, Dessa.
Holmes, R. H.	25 Sept. 1895	Madras, Bellary.
Coley, J. T.	26 Feb. 1896	21st Lancers, Dublin.
Millar, W. M.	do.	S. Africa.
Wilson, A. C.	3 June 1896	Bombay, Karachi.
Anthony, W. S.	14 Oct. 1896	Madras, Secunderabad.
Lenox-Cunyngham, H. M.	6 Jan. 1897	Bengal, Barrackpore, and Remount Depôt, Calcutta.
Shore, F. H.	do.	S. Africa, Pretoria.
Pallin, W. A.	do.	Bengal, Meerut.
Harris, P. J.	19 May 1897	Sick leave, England.
Wood, W. A.	7 July 1897	Punjab, Peshawer.
Bolton, D.	29 Sept. 1897	Bombay, Kirkee.
Moore, R. C.	8 Dec. 1897	Sick leave, England.
M'Gowan, J. A. B.	22 Jan. 1898	Bengal, Mian Meer.
Bartlett, E. B.	2 Feb. 1898	India.
Cochrane, R. C.	9 Mar. 1898	S. Africa, Middleburg, Transvaal.
Southey, J. B.	do.	S. Africa, Boukers Park.
Todd, A. G.	2 April 1898	S. Africa. Leave, England.
Durrant, H. M.	6 July 1898	Punjab. Leave, England.
Conder, G.	do.	Bengal, Jhansi.
Williams, A. J.	do.	India.
Griffith, J. J.	24 Aug. 1898	S. Africa, Pretoria.
Brown, E.	9 Nov. 1898	Madras, St Thomas's Mount.
Houston, R. F. St. C.	do.	Madras, Secunderabad.
Olver, A.	8 Mar. 1899	S. Africa, Pretoria.
Quinlan, D. J.	18 Nov. 1899	India.
Aitken, J. J.	13 April 1901	S. Africa, Pietersburg, N. Transvaal.
Deacon, A. F.	do.	S. Africa, Standerton.
Dalgleish, A. J.	do.	S. Africa, Bloemfontein, O.R.C.
Welch, H. C.	do.	Bombay, Mhow.
Fisher, O. S.	do.	S. Africa.
Gamble, H.	do.	On passage to India.
Lake, B. L.	do.	On passage to India.
Head, A. S.	do.	S. Africa.
Knott, G. P.	do.	S. Africa, Newcastle, Natal.
Hylton-Jolliffe, C. H.	5 June 1901	On passage to India.
Jackson, G. T.	2 Nov. 1901	S. Africa, Victoria Road, Cape Colony.
Lowe, W. C.	do.	Madras, Bangalore.
Swanston, A. N. M.	do.	India.
Russell, J. A.	do.	S. Africa, Elandsfontein.
Steel, C. E.	do.	S. Africa, Newcastle, Natal.
Gillett, E. S.	do.	India.
Beatty, P. V.	do.	India.
Porteous, R.	do.	India.
Barnard, L.	do.	Egypt.
Orton, E. C.	do.	S. Africa, Stellenbosh.
Roberts, N. D. E.	15 April 1902	Bengal, Lucknow.
Glasse, M. E. G.	do.	On passage to India.
Nicol, W. H.	do.	On passage to India.
Probyn, F. S.	do.	Vryheid.
Mosley, H. S.	do.	Bloemfontein.

Retired Veterinary Officers of the Regular Army who are Employed.

Berne, Vet.-Lieut.-Col. J. C. . Portsmouth.	Healy, Vet.-Major M. F. . . Cork.
Dwyer, Vet.-Lieut.-Col. J. C. . Woolwich.	Killick, Vet.-Major T. A. . . Shorncliffe.
Walters, Vet.-Lieut.-Col. W. B. C.B. . . . . Woolwich.	Powell, Vet.-Major B. A. . . Dorchester.
Case, Vet.-Major M. F. M. . Woolwich.	Rowe, Vet.-Major R. . . London.
Crow, Vet.-Major W. A. . . Aldershot.	Grainger, Vet.-Major J. K. . Norwich.

Officers of the Army Veterinary Department transferred to the Indian Civil Veterinary Department.

Veterinary-Majors.

Brodie-Mills, J. . . .	23 June 1895	Bombay, Principal Bombay Veterinary College.
Morgan, J. W. A. (temp. Vet. Lieut.-Col.), . .	12 June 1898	Simla, Insp.-General Ind. Civil Vet. Depôt.
Hagger, W. R. . .	13 July 1898	Bengal.
Ringe, R. H. . . .	5 Oct. 1898	Bengal.
Raymond, F. . . .	14 Dec. 1898	Bengal, Principal Calcutta Veterinary College.
Gunn, W. D. . . .	25 Dec. 1899	Punjab.

Veterinary-Captains.

Joslen, F.	9 May 1894	Bombay, Principal Ajemere Veterinary College. Rajputana.
Maxwell, H. M. . .	11 June 1894	Bombay, Supt. Scind and Baluchistan, Quetta.
Pease, H. T. . . .	27 Aug. 1894	Punjab, Principal Punjab Vet. College, Lahore.
Evans, G. H. . . .	do.	Burma, Supt. Burma, Rangoon.

Veterinary-Lieutenants.

Trydell, A. S. . . .	3 June 1891	Punjab.
Farmer, J. . . .	1 June 1893	Punjab.
Smith, A. . . .	21 June 1893	Punjab.
Baldrey, F. S. H. . .	28 Feb. 1894	Bombay, Professor Bombay Veterinary College.
Walker, G. K. . .	25 July 1894	Bengal.
Holmes, J. D. E. . .	28 Aug. 1895	Madras.
Dawson, ...	4 Sept. 1895	Punjab, Professor Punjab Veterinary College, Lahore.

Corrected up to date.

20th December 1902.

ARMY VETERINARY DEPARTMENT.

Dec. 1, 1902.—Vet.-Major R. Rowe (retired) to take veterinary charge of mounted troops Home District, excluding the Household Cavalry.

Nov. 22.—Civil Veterinary Surgeon E. P. Argyle arrived in S.S. Scott on sick leave.

Dec. 6.—Veterinary-Major J. K. Grainger retires on retired pay.—*London Gazette*, Dec. 5th, 1902.

Dec. 8.—Civil Veterinary Surgeon J. Buck resigns his appointment with Army Veterinary Department to take up an appointment with Repatriation Department in South Africa.

Civil Veterinary Surgeon Ellis terminates his engagement on reduction of establishment.

Civil Veterinary Surgeon F. A. Wall terminates his engagement on reduction.

Civil Veterinary Surgeon Dale terminates his engagement on reduction to take appointment in South African Constabulary.

Civil Veterinary Surgeon A. Greet terminates engagement.

Civil Veterinary Surgeon Gavin terminates engagement.

Dec. 13.—Veterinary-Major Duff Gillespie arrived from South Africa per S.S. Kildonan Castle.

Dec. 15.—Veterinary-Major J. K. Grainger (retired) posted to Norwich for duty.

Dec. 16.—Veterinary-Colonel F. Duck, C.B., on completion of tenure of appointment as Director-General, is placed on retired pay.

Dec. 5. Veterinary Lieutenant W. B. Edwards, to be veterinary captain.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending 20th December 1902.

ENGLAND AND WALES

Swine Fever.	Anthrax.	Glanders (including Farcy).	Rabies.	Sheep-Scab (for month of November).
Outbreaks 109 Slaughtered 532	Outbreaks 40 Attacked 45	Outbreaks 76 Attacked 113	Dogs 1 Other Animals 1	Outbreaks 128
SCOTLAND.				
Outbreaks 1 Slaughtered 4	Outbreaks 17 Attacked 23	Outbreaks 1 Attacked 1	None.	Outbreaks 20
IRELAND.				
Outbreaks 9 Slaughtered 85	None.	Outbreaks 1 Attacked 2	None.	Outbreaks 56

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin); Buletinul Societatii de Sciinte diu Bucuresci-Romania; The Meat Trades Journal; The Dental Record.

Owing to extreme pressure on our space, we are compelled to leave over various articles.